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IMPERIAL BUREAU OF ANIMAL HEALTH

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VETERINARY BULLETIN

Vol. 14.] **March, 1944.** [No. 3.

DISEASES CAUSED BY BACTERIA AND FUNGI

WATTS, P. S. (1943). **The Practitioner and Mastitis Control under the National Scheme.**—*Vet. Rec.* **55.** 175–177. Discussion pp. 177–179. **504**

This article is based on experience gained in an attempt to control contagious mastitis in 65 herds, involving the bacteriological testing of some 5,000 cows. Generally speaking, W. is disappointed with the results, as only four herds have been completely freed from infection. The following procedures are recommended. The approximate infection rate in the herd should be ascertained by means of bacteriological examination. When the infection rate is 10–15% all infected cows should be treated and those which do not respond should be sold. In herds where the infection rate is over 15%, the reason for this should be ascertained. A high proportion of old breeding stock, a large number of positive cows just calved or dried off, and the use of certain makes of milking machine are all factors which may influence the infection rate.

W. considers that a milking machine should milk at about 13 lb. pressure and 38 pulsations per min., and that it should be of light construction. There should not be more than three milking units per attendant.

Any cows showing a few clots in the milk should be treated with sulphanilamide for 2–3 days, and if bacteriological examination confirms a diagnosis of *Streptococcus agalactiae* infection, the sulphanilamide should be repeated for a further three days. When the infection is causing clinical mastitis, irrigation of the udder with acriflavine should be adopted. Details of the technique are given. Cases of *Str. dysgalactiae* and *Str. uberis* infections should be treated by stripping and massage. Staphylococcal mastitis can be treated with 10 ml. of staphylococcal toxoid daily for three days. M & B 693 was found to alleviate the toxic symptoms in *Corynebacterium pyogenes* mastitis.

Many points of practical importance were raised in the discussion which followed this paper.—D. L. H.

DUNN, H. O., MURPHY, J. M., & GARRETT, O. F. (1943). **Nature of the Material in Milk Responsible for the Modified Whiteside Test for Mastitis.**—*J. Dairy Sci.* **26.** 295–303. **505**

Evidence is submitted to show that leucocytes are directly or indirectly responsible for the Whiteside reaction [see *V. B.* **11.** 739.] in mastitis milk. The reaction was stronger in gravity cream, in which leucocytes concentrate, than in whole milk. Separator slime, which contains very large numbers of leucocytes, gave an intense Whiteside reaction, and a Whiteside-negative milk gave a positive reaction after the addition of separator slime. The addition of bovine or equine leucocytes to Whiteside-negative milk could effect the same change. The intensity of the reaction varied with the number of leucocytes. A suspension of bovine leucocytes mixed with *N* NaOH on a glass slide gave rise to a transparent viscid gel; the addition of one drop of normal milk gave an appearance of a typical positive Whiteside reaction.

It is postulated that protein material from the leucocytes reacts with the NaOH to form a gelatinous mass similarly to the action of NaOH on the nucleic acid from animal cells.—D. L. HUGHES.

VELU, H., SOULIÉ, P., & BELLOCQ, B. (1943). Charbon pulmonaire expérimental de la souris. Bactériémie ou septicémie précoce. **[Experimental Pulmonary Anthrax in the Mouse].**—*C. R. Soc. Biol. Paris.* **137.** 159–160. **506**

It had previously been shown [*Bull. Acad. Med., Paris.* **125.** 159. (1941)—unobtainable in the United Kingdom] that after exposure to very small doses of chlorine, inhalation of anthrax spores caused fatal pulmonary anthrax in mice, though untreated animals were not affected by comparable doses. The manner in which the stage of septicaemia developed was atypical. —J. G. CARR.

VELU, H., SOULIÉ, P., & BELLOCQ, B. (1943). Infection latente du poumon par *Bacillus anthracis*. Sa durée, ses risques. **[Latent Infection of the Lungs with *B. anthracis*].**—*C. R. Soc. Biol. Paris.* **137.** 224–225. **507**

After inhalation of large (300–600 spores) or small (10-30 spores) doses of *B. anthracis*, mice were subjected to varying degrees of chlorine poisoning, in order to precipitate the development of anthrax. By this method, it was determined that latent infection of the lungs with *B. anthracis* may endure up to ten days after a light infection and up to 20 days after a heavy infection.

POTTER, T. S. (1942). **Asphyxiated Bacteria as a Vaccine in Tuberculosis.**—*J. infect. Dis.* **71.** 232–236. **508**

In continuation of previous work [see MORTON *et al.* and POTTER—*V. B.* **9.** 585; **11.** 149, and **13.** 348.], fifty cultures of an avian strain (P.4) of tubercle bacilli were grown for one month; they were then sealed by fusing the mouths of the culture tubes and incubated for two months at 38°C. Suspensions from five of the tubes were tested in pigeons and found to have completely lost their virulence.

Thirty-three rabbits were then inoculated subcutaneously with these five suspensions at five-day intervals. After 4½ months, 21 rabbits were tested and after 12 months, seven rabbits were tested, by the intravenous injection of a 0·1 mg. dose of living tubercle bacilli, in each case an equal number of controls being used. Nineteen of the 21 control rabbits died 9–442 days after injection, and only six of the 21 vaccinated

rabbits died, in 10–368 days. Of the seven control rabbits in the second group, six died ; and of the seven vaccinated rabbits, only three died. But both vaccinated and control rabbits in this group showed more lesions than those in the first group, and the increase was greater in the vaccinated animals.

P. concludes that avian tubercle bacilli, when completely deprived of virulence by asphyxia, retain a marked though incomplete power of protecting rabbits against virulent infections with avian TB.—A. BUXTON.

LILLEENGEN, K., & NORDFELDT, S. (1942). Undersökningar rörande bovina tuberkelbacillens resistens i blod konserverat genom tillsats av A.I.V-vätska. **[Viability of Bovine Type Tubercle Bacilli in Blood Preserved by Mixing with A.I.V. Liquid].**—*Svensk VetTidskr.* p. 128. [Abst. from abst. in *Skand. VetTidskr.* **32.** 458 & 460]. **509**

The authors demonstrated that fluid from A.I.V. silage did not kill tubercle bacilli even when allowed to act for three months. [The A.I.V. method of making silage is named from its inventor, Dr. A. I. Virtanen, director of the research laboratory of Valio, the large Finnish co-operative dairy organization. The essential feature of the method is the prevention of proteolytic enzyme action by the addition of "A.I.V. solution" (a mixture of HCl and other acids), in sufficient quantity to maintain a pH below 4·0].—G. B. BROOK.

YUSKOVETS, M. K. (1943). Izyskaniya ratsional'nykh i effektivnykh metodov bor'by s tuberkulëzom krupnovo rogatovo skota. **[Measures for the Eradication of Bovine TB.]**—*Veterinariya, Moscow.* No. 2, pp. 22–25. **510**

Y. emphasises that when a herd is being freed from TB., tuberculin testing should be carried out more frequently than half yearly. In 31 herds consisting of 4,228 cattle, 11·4% reactors were detected after the first test and removed. A second testing 25–45 days later revealed 6·5% reactors ; it appears that some of these reactors were not tested when the first test was carried out. A third test was made 2½–3 months after the second and revealed an average of 3·6% reactors ; 88% of herds were then free of reactors, the presence of reactors on the remaining farms being considered to be due to the introduction of infection from outside, which necessitated a thorough disinfection of the premises. A fourth test made 4–6 months after the third revealed 0·1% reactors.

Y. considers that the use of intradermal tests, at short intervals, such as those used in the above work, enables TB. to be eradicated from most farms within seven months. He also states that other workers in Russia have obtained similar results.—A. MOLDAWSKY.

COTCHIN, E. (1943). **Tubercle Bacilli in Lesions of the Submaxillary Lymph Nodes of Swine.**—*J. comp. Path.* **53.** 310–314. **511**

Examination of apparently tuberculous submaxillary lymph nodes from 86 pigs yielded tubercle bacilli in 68 cases. Twenty-two were avian type and 46 mammalian. Suspensions of the avian strains were inoculated subcutaneously into g. pigs, none of which developed progressive TB. Twelve strains, however, produced progressive disease of young cockerels. All of the mammalian strains caused progressive TB. in g. pigs. —D. D. OGILVIE.

HALL, O. (1943). **Review of Tuberculosis Problem.** —*Canad. J. comp. Med.* **7.** 141–143. **512**

The steady though unspectacular success attained by the Health of Animals Division, since the commencement of bovine TB. eradication on an area basis in Canada, in 1923, is reviewed. Results of initial and subsequent tests made in the first area to be chosen (Carman area) are given in tables. At present, 49% of the cattle in Canada are under the Department's various policies for the eradication of this disease. Whereas, in the past, one of the problems encountered was not to move too far ahead of public opinion, to-day the problem is to keep up with the stockowner's demands for tests, retests, etc. Despite conditions brought on by the war, H. feels that the veterinarians will see the campaign through to the point where bovine TB. is completely eradicated in Canada.—J. L. BYRNE (CAN.).

PRIETO, C. (1942). Dos casos de infección natural de tuberculosis en ovinos. **[Two Cases of TB. in Sheep].** —*Rev. Fac. Agron. Vet., B. Aires.* **9.** 219–232. [English and Portuguese summaries]. **513**

P. records two cases of TB. in sheep caused by the bovine type of bacillus. In the first case, lesions were present in the lungs and related lymph nodes, myocardium, and diaphragm (the only organs available). They were regressive in character and were considered to be of alimentary origin.

The second case was one of generalized progressive TB., lesions being found in the lungs, liver, and spleen (again the only material examined). This case was assumed to be of pulmonary origin.—I. W. BURTON.

HAUDUROY, P. (1943). Action de certains bacilles paratuberculeux sur le *p*H des milieux de culture. **[Action of Saprophytic Acid-Fast Bacteria on the pH of the Culture Medium].**—*C. R. Soc. Biol. Paris.* **137.** 181. **514**

The suggestion of CABASSO [*V. B.* **12.** 570.] that the variation in the production of acid during cultivation could be utilized as a means of classifying these organisms was tested on nine strains. Together with C.'s results, this gave data for 17 strains. As there were five different types of acid production, H. concludes that this method is unlikely to yield a simple and practicable method of classification.—J. G. CARR.

FRANCIS, J. (1943). **Infection of Laboratory Animals with Johne's Disease and Leprosy.**—*Nature, Lond.* **152.** 250–251. **515**

The recent literature on the attempted infection of laboratory animals with *Mycobacterium leprae* is reviewed. Having summarized his recent article in which he claims to have infected young mice with cultures of *Mycobact. johnei* [see *V. B.* **13.** 239, abst. 1586.], F. suggests that the inoculation of very young laboratory animals with material containing *M. leprae* might meet with success.—R. E. GLOVER.

EVELETH, M. W., & EVELETH, D. F. (1943). **Johne's Disease of Goats.**—*Vet. Med.* **38.** 258–261. **516**

In two herds of goats examined by one of the authors in 1942, 24% of 263 animals reacted to johnin, revealing the widespread incidence of the disease. Details are now given of investigations made in three further herds of goats.

The authors point out the close similarity between cases of parasitic infestation and of Johne's disease and the importance in diagnosis of a P.M. examination. The disease runs a course which closely resembles that in cattle, tending to develop clinically soon after kidding, with severe diarrhoea followed by loss of flesh and hair. The authors have observed that in badly affected herds, fertility is lowered and abortions are not uncommon. P.M. changes are not very characteristic ; the ileum and the caecum may be very slightly thickened, but not drawn up in the well known ridges observed in cattle. The ileo-caecal valve may be oedematous and there may be some slight haemorrhages on the mucous membrane of the duodenum. Many acid-fast organisms are usually to be found in the lymph nodes associated

with the abomasum, duodenum, caecum, and mesentery. They are not readily found in the faeces.

The intradermal johnin test carried out on the caudal fold is of very limited value as a means of diagnosis. A positive reaction following the injection of 0·2 ml. of johnin is indicated first by a diffuse reaction, followed in 72 hours by a discrete swelling.

—N. S. BARRON.

BOYD, W. L., & KELLY, M. D. (1943). **Isolation of Corynebacterium pyogenes from a Fetus and Later from the Mammary Gland of the Dam. (A Case Report).**—*J. Amer. vet. med. Ass.* **103.** 24–25. **517**

A six-year-old cow, which had shown a positive blood titre for *Brucella abortus*, aborted during the seventh month of pregnancy. *Corynebact. pyogenes* was isolated from the lungs, liver, heart, and spleen of the foetus, but no brucella were recovered. The uterus resolved normally after the abortion. Six months later, a teat of the cow was severely injured and the animal was slaughtered. By histological and cultural methods, *Corynebact. pyogenes* was demonstrated in the uterus and in the udder ; there was very little damage to tissue in the uterus but there were some large abscesses in the udder tissue.—B. WEITZ.

BROWN, J. A., & STUART, J. D. (1943). **The Treatment of Summer Mastitis using Corynebacterium pyogenes Toxoid.**—*Vet. Rec.* **55.** 315–316. **518**

Thirteen confirmed cases of *Corynebact. pyogenes* summer mastitis were treated by frequent strippings and massage, as well as by three subcutaneous injections of 10, 15, and 20 ml. of specific toxoid given at two-day intervals. The results were quite encouraging, but the affected quarters were not saved.—M. L. LEVI.

SMITH, H. C., & HARNDEN, E. E. (1943). **Mastitis in Sheep and Goats a Pasteurellosis.**—*Vet. Med.* **38.** 299–301. **519**

An acute mastitis of breeding ewes kept at the Oklahoma Agricultural and Mechanical College is described, and an organism which the authors identified as *Pasteurella multocida* was constantly isolated from affected udder tissues but was never present in the udder secretion. Treatment of affected ewes with autogenous bacterins of *Past. multocida* was effective in preventing death, but failed to restore function to affected udders. [Clinically, the disease described is very similar to the British "black garget", caused by Nocard's micrococcus.]—G. B. S. HEATH.

COFFEE, W. M., & MILLER, J. (1943). **Acute Canine Tularemia : A Case Report.**—*J. Amer. vet. med. Ass.* **102.** 210–212. **520**

This is stated to be the first description of the symptoms of tularaemia in the dog, in which infection was naturally acquired ; the animal was five years old. The most characteristic symptom was the occurrence of irregular swellings along the course of the superficial lymphatics, and in the lymph nodes which showed a tendency to burst, drain, and disappear. These swellings contained a thick, tenacious, reddish-amber pus with little necrotic debris, and were suggestive of the lesions seen in wild rabbits. Eye lesions were also present. No *Pasteurella tularensis* antigen was available, nor facilities for cultural work ; "we knew there was a cross-agglutination between *Brucella abortus* and *Past. tularensis*". As a positive agglutination reaction occurred with the patient's serum and an *abortus* antigen, this was considered to be confirmatory evidence that the disease was, in fact, tularaemia.

The course of the disease is described ; the case was not apparently fatal, but the authors make no mention as to whether complete recovery occurred. Neither arsenicals nor sulphanilamide altered the course of the disease in this case.—N. J. SCORGIE.

KOHLS, G. M., & STEINHAUS, E. A. (1943). **Tularemia : Spontaneous Occurrence in Shrews.**—*Publ. Hlth. Rep. Wash.* **58.** 842. **521**

A brief note stating that the authors have recently demonstrated *Pasteurella tularensis* in the shrew, *Sorex vagrans monticola*, thus adding another species to the native fauna known to contract the disease naturally in parts of the U.S.A. They also demonstrated the organism in the field mouse, *Microtus pennsylvanicus modestus*.

RANSMEIER, J. C. (1943). **The Reaction of the Chick Embryo to Virulent and Nonvirulent Strains of Bact. tularense.**—*J. infect. Dis.* **72.** 86–90. **522**

Chick embryos were found to be about as susceptible as white mice to inoculation with virulent strains of *Pasteurella tularensis*, and both species survived inoculation with non-virulent strains. Embryos of 14 days' incubation, inoculated by dropping standardized bacterial suspension on to the chorio-allantoic membrane, were found to be most suitable ; as the virulence of the organism was estimated from the survival times of the embryos, and there was a variable accidental mortality, an adequate number of controls had to be provided. Virulent strains killed the embryos within 72–120 hours after inoculation, while non-virulent strains produced no effect apart from occasional focal papule formation.—E. COTCHIN.

EDWARDS, P. R., & BRUNER, D. W. (1943). **The Occurrence and Distribution of Salmonella Types in the United States.**—*J. infect. Dis.* **72.** 58–67. **523**

Over three thousand strains were collected from man and animals in the U.S.A., and 95% were classified according to the A–E groups of the Kauffmann-White scheme. An analysis was made of the relative frequency of occurrence and of the distribution among the different animal species of the 59 salmonella types encountered. Several new types are described and many others are recognized for the first time as being causative agents of disease in animals. A wide variety was found in fowls, pigs, and man, in contrast to the less varied flora of horses, ruminants, carnivores, and rodents.

S. paratyphi B was isolated on a few occasions from chickens and pigs and such animals are considered as potential reservoirs of enteric fever.

S. typhi-murium was the most widely distributed of all the salmonella, since it probably attacks all warm-blooded species.

S. cholerae-suis was much more commonly found than *S. typhi-suis*. *S. dublin* was frequent in foxes, but was unusually rare in cattle.

S. pullorum occurred not only in fowls but also in pigs, foxes, and in a case of mild gastro-enteritis in man.

The great majority of the salmonella species were identified in a number of different species of animals, which emphasizes their lack of host specificity.

It is shown that a small number of O sera are helpful in quickly establishing the group to which a fresh strain belongs.—J. KEPPIE.

PACHECO, G., & COSTA, G. A. (1940). Comentario ao esquema de classificação das Salmonellas de Kauffmann-White. **[Commentary on the Kauffmann-White Classification Scheme for Salmonella].**—*Mem. Inst. Osw. Cruz.* **35.** 365–374. [English summary]. **524**

The authors make some criticism of the Kauffmann-White scheme. They appear to desire a method of classification which can be carried out with simple reagents. They emphasize that it approximates bacteria

which are unrelated to the salmonella, such as *Chromobacterium typhi-flavum*, and separates types of salmonella which are biologically closely related or almost indistinguishable from each other.—ISOBEL W. BURTON.

ZELLE, M. R. (1942). **Genetic Constitutions of Host and Pathogen in Mouse Typhoid.**—*J. infect. Dis.* **71.** 131–152. **525**

Four albino strains of mice of varying hereditary resistance to *Salmonella typhi-murium* infection were used to study interactions between host and pathogen in mouse typhoid, by passage through them of strains derived from a stock culture of consistently high virulence. In both resistant and susceptible hosts, virulence increased in each of four passage series derived from a stock culture composed of bacterial types of different virulence. That increased virulence was observed in only a low proportion of cases following passage of recently isolated single-cell cultures indicated a high degree of stability in the virulence of this organism. Decreased virulence was not encountered following passage through either resistant or susceptible mice. The correlation of large increases in virulence with big changes in colony type of the bacterial populations examined indicated that selection in the host of more virulent bacterial variants might be the mechanism responsible for observed changes in virulence. The more frequent isolation of virulent rather than avirulent bacteria from mice given similar doses confirmed the differential survival of virulent and avirulent bacteria in the host.

Discontinuous variation (*i.e.* true mutation) was demonstrated in *S. typhi-murium* by employing a simple single-cell technique in the study of an unstable S culture exhibiting frequent mutation to a stable R type. Equations are given for the indirect estimation of rate of bacterial mutation.

Virulence proved to be unrelated to growth rates or fermentation tests and to be unaffected by serial passage on artificial media.—R. O. MUIR.

CRUICKSHANK, J. C. (1943). **Possible Association of Bact. Typhi-murium var. Copenhagen with Pigeons.**—*Mon. Bull. emerg. publ. Hlth Lab. Serv., Lond.* **2.** 85–86. **526**

The isolation is reported of *Salmonella typhi-murium* with the antigenic structure of var. *copenhagen* from the urine of a human being, suffering from a febrile illness, whose serum showed an agglutinating titre for a salmonella group suspension and for *S. typhi-murium* H-specific antigen. Reference is made to two homer pigeons, kept in the house for a week before and during part of the patient's illness, as being a possible source of infection, and to the recovery from pigeons in the U.S.A. of 126 salmonella strains, of which 121 were identified as *S. typhi-murium* var. *copenhagen*.
—R. O. MUIR.

REIS, J. (1942). Artrite em galinha produzida por " Salmonella pullorum ". **[Arthritis in a Fowl Caused by *S. pullorum*].**—*Arq. Inst. Biol., S. Paulo.* **13.** 115–118. [English summary]. **527**

S. pullorum was isolated in pure culture from purulent exudate in the inflamed tibio-tarsal joint of an adult fowl. The organism did not appear to have localized in any other part of the body.—I. W. BURTON.

GUERRERO, R. P. (1943). **Salmonellosis of Calves in Tropical Countries.**—*J. Amer. vet. med. Ass.* **103.** 152–154. **528**

The most important cause of heavy mortality among calves two weeks to four months old in Colombia and Ecuador is *Salmonella enteritidis* infection. The lesions and symptoms are those of a septicaemic intestinal affection, with involvement of the respiratory system, and mortality may be well over 60%. Acute cases predominate in the early stages of outbreaks, which are commoner in the warm rainy season. Predisposing factors include parasitic disease (intestinal and tick-borne), and a low state of nutrition and poor housing and management of calves, especially in dairy herds. The carrier cow is the source of infection, and manure the main vehicle of spread. Control measures indicated to check the course of the disease on infected farms include vaccination, segregation of sick animals, elimination of carrier cows, dipping against ticks, a raised standard of nutrition and management, and avoidance of calving in the hot rainy season.—E. C.

BUENO, P. (1942). Histopatologia dos ganglios linfáticos na brucelóse suina. **[Histopathology of the Lymph Nodes in Porcine Brucellosis].**—*Arq. Inst. Biol., S. Paulo.* **13.** 291–298. [English summary]. **529**

Pathological lesions in the lymph nodes of swine dead of brucellosis are characterized by rarefaction of the lymphatic tissue, neutrophilic and eosinophilic infiltration, the presence of focal necrosis and of giant cells, and degenerative changes in the blood vessels, associated with haemorrhages.

Lesions in animals with latent infections include aplasia of connective tissue, reticular proliferation, eosinophilia, and proliferative vascular changes. In some cases signs of regeneration may be seen.

In animals in which exacerbation of the disease process follows abortion, there is evidence of regeneration of the lymphatic tissue, along with signs of an allergic reaction, such as regressive and proliferative changes in the blood vessels, eosinophilia, haemorrhages, oedema, and fibrin-like degeneration in some areas of the reticular tissue.

In general, the lesions are sufficiently characteristic to permit differentiation from other inflammatory processes.—ISOBEL W. BURTON.

PHILLIPS, C. E. (1943). **Alcaligenes (Brucella) Bronchisepticus as a factor in Porcine Pneumonias.**—*Canad. J. comp. Med.* **7.** 58–59. **530**

A micro-organism of the *Alkaligenes* type was isolated in pure culture from viscous bronchial exudate of consolidated lung portions obtained from eight piggeries in various parts of Ontario. The animals exhibited chronic coughing and unthriftiness. The mortality rate was variable. Details of the organism are briefly described.—H. KONST (CANADA).

ROGICK, F. A. (1941). Pesquisas sôbre a brucelose caprina em São Paulo. **[Caprine Brucellosis in Sao Paulo, Brazil].**—*Bol. Indústr. anim.* **4.** No. 1. 33–37. [English and French summaries]. **531**

Agglutination tests, carried out with a polyvalent antigen, consisting of *Br. abortus*, *Br. suis* and *Br. melitensis*, on 1,000 blood samples from a representative selection of goats, proved negative in every case. The findings are in accordance with the fact that no cases of human brucellosis of caprine origin have been observed in São Paulo.—ISOBEL W. BURTON.

LERENA, E. A. (1943). Aborto èpizóotico del vacuno. **[Bovine Contagious Abortion].**—*Rev. zootéc.* **30.** No. 251. 40–47. **532**

A conventional article, presenting no new material.

—. (1943). Bayern. Rauschbrandschutzimpfungen und Rauschbrandfälle im Jahre 1942. **[Bavaria : Blackleg Immunization in 1942].**—*Reichsgesundheitsblatt.* **18.** 612. **533**

Brief statistical information is given relating to the vaccination campaign against blackleg carried out in certain districts of Bavaria. Of 16,780 cattle which received an injection of the muscle-powder vaccine,

only two died of blackleg, and there were no cases amongst the 10,569 animals which were injected with a formolized vaccine. In Upper Bavaria, seven cases are recorded in unvaccinated animals of $1\frac{1}{4}$–$4\frac{1}{2}$ years of age, and in one instance the only unvaccinated animal of a group of 20 bullocks died of the disease.

Despite the low incidence of cases in the unvaccinated community, the campaign was considered to have been fully justified.—N. S. BARRON.

BAKER, A. B. (1943). **Medullary Involvement in Tetanus.**—*Amer. J. Path.* **19.** 709–723. **534**

Detailed pathological studies were undertaken of 12 fatal human cases of tetanus, in an attempt to locate changes in the nervous system and, if possible, to relate them to the duration of the illness. In all cases of illness lasting over three days, definite changes in the nervous system were detected. Up to the fifth day, such changes were limited to the nerve cells and consisted of mild swelling and chromatolysis. After the fifth day, lesions were much more extensive and consisted of perivascular glial nodules and perivascular demyelinization. The most extensive involvement occurred within the motor nuclei of the fifth and the dorsal nuclei of the tenth cranial nerves. In the rest of the nervous system, the changes were scattered and were of a minor nature. It is suggested that since tetanus toxin appears to be selective for specific cranial nerve nuclei, some of the deaths from the disease may result from respiratory or cardiac failure due to medullary involvement.—D. D. O.

PACHECO, G., & COSTA, G. A. (1940). Produção de H^2S pelos Clostridios anaerobios. **[Production of H_2S by Clostridia].**—*Mem. Inst. Osw. Cruz.* **35.** 311–316. [English summary]. **535**

Liver-spleen-cystine medium, with bismuth carbonate as indicator, favours the production of H_2S by pathogenic and non-pathogenic anaerobes. There are marked variations in the time and intensity of gas production between different clostridia and between different strains of the same *Clostridium*.—ISOBEL W. BURTON.

PACHECO, G., & COSTA, G. A. (1940). A capacidade sulfidrigena (produção de H^2S) é uma propriedade geral das bacterias heterotroficas. **[H_2S Production as a General Property of Heterotrophic Bacteria].**—*Mem. Inst. Osw. Cruz.* **35.** 381–397. [English summary]. **536**

Representatives of heterotrophic bacteria of 17 genera, including staphylococci, *Bact. coli*, salmonella, and pasteurella, were tested for H_2S production, on a liver-spleen medium with bismuth carbonate as indicator.

All species tested produced H_2S, but there were variations in the time and amount of gas production, between the various genera, between different species, and between different strains of the same species.

—ISOBEL W. BURTON.

PACHECO, G., & COSTA, G. A. (1940). Ação do oxigenio sob pressão sobre a ação patogenica dos germens anaerobios. **[Action of Oxygen Under Pressure on Pathogenicity of Anaerobic Bacteria].**—*Mem. Inst. Osw. Cruz.* **35.** 303–309. [English summary]. **537**

Oxygen under pressure reduces the infectivity of *Clostridium oedematiens* and *Cl. welchii* cultures, by destroying the majority of the organisms present, the lethal action of the oxygen being related to the length of exposure.—ISOBEL W. BURTON.

PACHECO, G., MATTOSO, I. V., & COSTA, G. A. (1940). Fermentação da gelose pelas bacterias anaerobias. **[Fermentation of Agar by Anaerobic Bacteria].**—*Mem. Inst. Osw. Cruz.* **35.** 193–203. [English summary]. **538**

Anaerobes of the genus *Clostridium*, of both saccharolytic and non-saccharolytic types, acidify sugar-free mineral media when agar is added. The acidity results from bacterial attack on agar, as a source of carbon, and may be sufficient to give misleading results in fermentation tests carried out in semi-solid media containing agar.—ISOBEL W. BURTON.

See also absts. **591**, **683** (mastitis), **624**, **625** (strangles), **584**, **585**, **587**, **622**, **699** (cocci), **581**, **634**, **635**, **701** (TB.), **591**, **629** (*Erysipelothrix*), **582** (tularaemia), **560** (*Haemophilus influenzae-suis*), **586** (*Bact. coli*), **595** (salmonella), **698** (bacteria in meat), **695** (brucella), **591** (blackleg), **569** (bovine contagious pleuro-pneumonia), **591** (antisera), **617** (bacterial toxins and tumours), **700–704** (cultivation of bacteria).

DISEASES CAUSED BY PROTOZOAN PARASITES

MACAULAY, J. W. (1942). **A Tsetse Fly and Trypanosomiasis Survey in Bechuanaland, 1940-1942.** pp. 68. Mafeking: Bechuanaland Protectorate Government Veterinary Department. [4to]. **539**

This report is divided into ten parts and contains four notes as appendixes.

Historical notes reveal that tsetse flies were recorded in Bechuanaland by the earliest explorers, but little notice was taken of the menace of trypanosomiasis till 1923. Since then the fly-infested area has further increased from 4,592 to 6,720 sq. miles, though it is suggested that some of this extension may be re-occupation by the fly of areas evacuated after the rinderpest epizootic of 1894–96. In 1938, four cases of human sleeping sickness raised the threat of a minor epidemic, and in 1939 a veterinary officer was appointed to undertake a tsetse fly and trypanosomiasis survey of the country and stock.

The survey covered the fields of observation and control of game, trypanosomiasis of stock, survey of the actual limits of fly belts, and compilation of information on the bionomics of the fly. To assist in this work a large area of the fly belt was surveyed by air, and a mosaic was made from aerial photographs. It was from a study of one of these mosaics that an area was selected which yielded the first pupa case to be found in Ngamiland.

There are sections on the physical and social conditions in Bechuanaland as they affect the problem of tsetse control, and on the game encountered and suggestions for their reduction. Another section deals with trypanosomiasis of stock, the disease occurring frequently in cattle, rarely in horses, and occasionally in goats and donkeys; no cases have been recorded in sheep. *T. congolense* has been the only trypanosome encountered in stock. Recently a system has been adopted of removing clinically suspected cattle from herds and treating them with weekly intravenous injections of 20 ml. of a 4% solution of tartar emetic. Good results are claimed and it is recommended that this measure should be extended. Outbreaks of disease have come under observation, however, which are believed to have been spread mechanically from treated animals which had relapsed.

The fly involved in Bechuanaland is *Glossina morsitans* and in this area it seems to require both cover and thicket, the open savannah country being of limited use to the fly because of the danger of desiccation. Selective clearing and burning proved relatively valuable in control, but traps were not satisfactory. Recom-

mendations for control include an extension of the trypanosomiasis treatment organization, the control of game, the clearing and settling of certain areas, and the use of traps round native settlements exposed to fly invasion.

In an appendix entitled " Possible Means of the Eradication of Trypanosomiasis through Rinderpest ", it is suggested that the cattle might be protected against rinderpest by goat virus inoculation. Rinderpest could then be passed to the buffalo and other large ungulates in the swamp area, thus producing artificially a catastrophic reduction in food supply of the tsetse. Adequate measures would be taken to prevent a " centrifugal stampede " from the area, and to protect the human population against temporary intensification of fly activity against man.—U. F. RICHARDSON.

LEWIS, E. A., WILEY, A. J., & MACAULAY, J. W. (1943). **The Transmission of *Trypanosoma congolense* by *Glossina austeni*.**—*Ann. trop. Med. Parasit.* **37.** 98–107. **540**

The *G. austeni* used in the experiments were reared from wild pupae and were infected by being fed on rabbits which had been inoculated with a strain of *T. congolense* from a naturally infected ox. Cattle, sheep, goats, pigs, mules, rabbits, a dog, a buffalo, and an oryx were infected by bites of these flies. The sheep, two out of three goats, one pig, and the oryx survived the experiment whilst the remaining animals died, but in view of the small numbers of some of the species under experiment this mortality cannot be taken as a guide to the pathogenicity of the organism. The incubation period after fly infection was 10–35 days, and after inoculation 6–16 days. In most animals a febrile reaction commenced about the same time as the appearance of trypanosomes in the blood, but later fluctuations in temperature did not appear to be related to the number of trypanosomes in the peripheral blood. In the pig, dog, and oryx the temperature reaction was slight or absent, whilst in the mules, though one animal showed slight initial fever, the most pronounced reaction was a second phase of subnormal temperature.

At the end of the experiments the 21 flies remaining alive were dissected, and in two flies the labrum was found to contain dense colonies of parasites, the hypopharynx was lightly infested, and a few immature forms of the parasites were seen in gut preparations.

—U. F. RICHARDSON.

POURSINES, Y., & DARDENNE, P. (1943). Les lésions du système nerveux central au cours de la trypanosomiase *Evansi* expérimentale (souche Syrienne) chez le rat, le cobaye, le chien et le cheval. [**Lesions of the Central Nervous System in *Trypanosoma evansi* Infection (Syrian Strain) in Rats, Guinea Pigs, Dogs, and Horses**].—*C. R. Soc. Biol. Paris.* **137.** 247–249. **541**

After inoculation with a strain of *T. evansi* which had been maintained in the laboratory for six years, horses, rats, g. pigs, and rabbits died from cachexia and prostration with few or no nervous symptoms, whilst dogs exhibited posterior paralysis in the final stages. The lesions of the central nervous system were similar in all the animal species, and consisted of a leptomeningitis, the basal meninges being most markedly affected. The meninges showed a histio-monocytic proliferation of the connective tissue layer of the blood vessels with round-celled perivascular cuffing. More rarely the nervous tissue participated, and some neuronophagia was encountered.—U. F. RICHARDSON.

PARROT, L., DONATIEN, A., & PLANTUREUX, E. (1941). Sur l'infection naturelle des phlébotomes par la leishmaniose générale de l'homme et du chien en Algérie. [**Natural Infection of *Phlebotomus* by *Leishmania* of Man and Dogs in Algeria**].—*Arch. Inst. Pasteur Algér.* **19.** 209–218. **542**

An investigation into the prevalence of species of *Phlebotomus* in Algiers and the incidence of infection with *Leishmania*, showed that the insects were most prevalent in June and September. *P. perniciosus* and *P. longicuspis* taken from a kennel where the dogs were infected with leishmaniasis both showed intestinal flagellates invading the anterior parts of the digestive tract. The greatest numbers were found infected in June. 34·8% of *P. perniciosus* and 48% of *P. longicuspis* were infested with flagellates, 70% of the former and 63·4% of the latter showing an anterior infection.

Over 200 flies were reared from females collected, but none of the flies reared in captivity showed flagellate infection.

It is concluded that *P. longicuspis* must be considered to be a carrier of leishmaniasis, and that hereditary transmission of leishmania does not occur.—U. F. R.

HAMMOND, D. M., & BARTLETT, D. E. (1943). **Establishment of Infection with Trichomonas Foetus in Bulls by Experimental Exposure.**—*Amer. J. vet. Res.* **4.** 61–65. **543**

Attempts were made by various means to infect six bulls with *T. foetus*. Cotton pledgets, soaked in vaginal washings from infected heifers, were introduced into the prepuce of five bulls, of which two became infected. Three bulls remained uninfected after service of infected heifers and introduction of pledgets, and one resisted infection by service alone. No obvious clinical symptoms were observed in either of the two bulls which became infected. It is suggested that the results indicate that there is an individual variation in the resistance of bulls, and that this probably explains why some bulls become infected by natural means, whilst others do not.—U. F. RICHARDSON.

HAMMOND, D. M., & BARTLETT, D. E. (1943). **The Distribution of Trichomonas Foetus in the Preputial Cavity of Infected Bulls.**—*Amer. J. vet. Res.* **4.** 143–149. **544**

The preputial cavities of four infected bulls were examined 15 times under epidural anaesthesia. The area of the cavity is described as divided into the galea glandis, the portion of the glans penis not including the galea, the smooth area of the preputial membrane adjacent to the glans, the more highly folded area of the preputial membrane about midway between the glans and the preputial orifice, and the folded area adjacent to the preputial orifice.

Trichomonads were usually found in highest numbers on the portion of the glans not included in the galea, and it was confirmed that the epithelium of this area showed numerous well defined infoldings as described by ABELEIN [*V. B.* **12.** 336, II]. The highest numbers of trichomonads were found in areas with the greatest quantity of smegma, and variations occurred in the concentrations encountered in the various areas at different examinations. The urethral flushings from all four bulls were negative.

No consistent abnormality was detected in the appearance of the prepuce or penis. At times, reddened pin-point areas were observed scattered on the glans penis and adjacent prepuce, but it is doubted whether these lesions are aetiologically related to trichomoniasis.

—U. F. RICHARDSON.

SCHULEMANN, W., & KNOCHE, E. (1941). Zum Problem der exo-erythrocytären Entwicklungsformen von *Plasmodium gallinaceum*. I. [**Problem of Origin of Exo-Erythrocytic Development Forms of *P. gallina-***

ceum. I].—*Arch. exp. Path. Pharmak.* **197.** 227–239. **545**

KNOCHE, E. (1941). Zum Problem der exo-erythrocytären Entwicklungsformen von *Plasmodium gallinaceum.* II. **[Problem of Origin of Exo-Erythrocytic Development Forms of *P. gallinaceum.* II].**—*Ibid.* 240–251. **546**

I. If a suitable quantity of a colloidal solution of palladium is injected intravenously at the climax of the erythrocytic infection of the fowl with *P. gallinaceum*, in the majority of cases a sudden decline in the number of parasites in the bloodstream can be observed. If the palladium solution is injected intravenously prior to the first appearance of parasites in the circulating blood, in most cases there is only a light erythrocytic infection. When animals are given an intravenous injection of colloidal palladium solution before being infected, then in most cases the time elapsing between infection and the first appearance of the parasites in the circulating blood is increased. Several intravenous injections of colloidal solutions of palladium at the beginning of an infection result in the majority of cases in the production of an abnormally high number of exo-erythrocytic forms which occur in all organs but particularly in the brain, and give rise to severe disturbances of the central nervous system. Occlusion of the blood vessels by exo-erythrocytic forms can lead to multiple haemorrhages of the brain. An early intravenous injection of a colloidal solution of palladium can greatly reduce the intensity of the culmination point of the disease. The general condition of the fowls treated with palladium appears to be better during the erythrocytic infection than is that of the experimental fowls which have not been so treated. By using intravenous injections of colloidal palladium, it is impossible to make the exo-erythrocytic forms appear at an earlier stage than after intramuscular infection, though the development of the exo-erythrocytic forms attains to a far greater measure than is usual. Similar results are not obtained when solutions of different colloidal character are employed. It appears that the infection of the fowl with *P. gallinaceum* can be influenced towards the development of exo-erythrocytic forms by the use of intravenous injections of colloidal palladium. The exo-erythrocytic phases of development probably have their origin in the erythrocytic forms as well as in the sporozoites.

II. In infection of the fowl with *P. gallinaceum*, it is supposed that after intramuscular injection of erythrocytes containing the parasite, an erythrocytic infection first develops. Some of the infected erythrocytes are taken up by the reticulo-endothelial system but the majority are probably destroyed. Very few of them proceed to give rise to exo-erythrocytic pigment-free forms. K. suggests that the r.e.s. may become activated by intravenous injections of colloidal palladium to an increased phagocytic ability, with the result that a greater number of infected erythrocytes is phagocytized by the r.e.s. than under normal conditions. This provides the conditions for an increased development of exo-erythrocytic forms, whereas the erythrocytic infection diminishes.—C. HORTON SMITH.

TCHERNOMORETZ, I. (1943). **Blocking of the Brain Capillaries by Parasitized Red Blood-Cells in *Babesiella berbera* Infections in Cattle.**—*Ann. trop. Med. Parasit.* **37.** 77–79. **547**

In Palestine, *Babesiella berbera* [= *Babesia argentina*] produces a more severe disease than does *B. bigemina*, although parasitized erythrocytes are not usually as numerous in the blood as they are in *B. bigemina* infection. In most fatal cases, animals show symptoms related to the central nervous system and there is little correlation between the numbers of parasites in the blood and the mortality.

In 12 cases, the brain capillaries were found to be blocked with parasitized erythrocytes. In three of these cases, parasites were detected in the blood shortly before death, in four others the blood infection had diminished to such an extent that parasites were not detected in the blood before death, and in the other five cases the parasites had never been detected in the blood during life. Blocked capillaries occurred in both the cerebrum and cerebellum, the infected erythrocytes appearing to be adherent to the endothelium of the capillaries. Neither stilbamidine, pentamidine, nor acaprin were found to be of value in the treatment of *B. berbera* infections. It is noted that stilbamidine clears the blood of *B. bigemina* parasites more rapidly than does acaprin.—U. F. RICHARDSON.

HOWELL, D. E., STILES, G. W., & MOE, L. H. (1943). **The Fowl Tick (Argas Persicus), a New Vector of Anaplasmosis.**—*Amer. J. vet. Res.* **4.** 73–75. **548**

Attempts to transmit anaplasmosis by *A. persicus* and *Ornithodoros megnini* were unsuccessful, except in one case in which 75 *A. persicus*, fed on an animal with acute anaplasmosis, were transferred to another animal after two weeks' storage; anaplasms appeared in the blood of the second animal after an incubation period of two months. Recently, *A. persicus* has been identified amongst ticks taken from cattle and sent in for examination. It is suggested that they may feed on cattle more readily than has been supposed, as in view of their nocturnal feeding habits they would not easily be observed.—U. F. RICHARDSON.

ENIGK, K. (1943). Die Überträger der Pferdepiroplasmose, ihre Verbreitung und Biologie. **[Vectors of Equine Piroplasmosis; their Geographical Incidence and Biology].**—*Arch. wiss. prakt. Tierheilk.* **78.** 209–240. **549**

Experimental transmission of *Babesia equi* and *B. caballi* was obtained with *Rhipicephalus sanguineus*, *R. bursa*, *Hyalomma dromedarii*, *H. marginatum*, and *H. anatolicum*, but not with *Boophilus calcaratus*. Progeny of infected ticks transmitted the infection in the imago stage, although the larvae and nymphs were not infective. Mild infections with both *B. equi* and *B. caballi* were encountered, in which no clinical symptoms developed.

It is suggested that species of *Boophilus* are probably not responsible for the transmission of equine piroplasmosis, but that many species of *Dermacentor*, *Hyalomma*, and *Rhipicephalus* may be involved. E. gives the known distribution of the various species of ticks which may be concerned, and speculates on the chances of the extension of infestation to new areas. The biology of the ticks involved is sketched in relation to the bearing of their various modes of life on the transmission of equine disease.—U. F. RICHARDSON.

CHAMBERLAND, H. (1943). La leptospirose du chien et du renard. Ictère infectieux et typhus canin. **[Leptospirosis of Dogs and Foxes. Infectious Icterus and Canine Typhus].**—*Canad. J. comp. Med.* **7.** 39–46. [In French]. **550**

This paper deals with the aetiology, pathogenicity, susceptibility of animal species, mode of infection, symptoms, pathological anatomy, prognosis, differential diagnosis, transmission to man, prophylaxis, and treatment of *Leptospira icterohaemorrhagiae* and *L. canicola* infections of dogs and foxes. In the Province of Quebec, leptospirosis was first suspected in silver foxes in 1940, when 15 animals died in an outbreak. Leptospira [presumably *L. icterohaemorrhagiae* is meant] were recovered

from the blood of a sick fox, but could not be demonstrated in any of the dead animals.—R. GWATKIN (CAN.).

BROOM, J. C., & BROWN, H. C. (1943). **Abnormal Agglutination Reactions of a Strain of Leptospira icterohaemorrhagiae.**—*Brit. med. J.* June 26th. 783–784. **551**

Out of sera from 70 cases of human jaundice, 34 agglutinated a strain of *L. icterohaemorrhagiae* which had been in use for eight years as a diagnostic antigen. These positive sera did not agglutinate other strains of *L. icterohaemorrhagiae*, and did not protect g. pigs against infection with a virulent culture of leptospira. They also failed to produce adhesion with the strain of leptospira which they agglutinated. No leptospira were seen in deposits of centrifuged urine from the 34 cases, nor did the inoculation of their blood into g. pigs produce infection.

It is suggested that these non-specific agglutinations were due to an acquired abnormal susceptibility of the antigenic strain. This instability was lost on further subculture, and the sera from the jaundice cases failed to agglutinate organisms from later cultures. It is considered that an additional factor was present in the serum, since the sera of only a proportion of the cases produced agglutination.

This phenomenon lends support to the view that serological diagnosis of Weil's disease should only be undertaken at laboratories where the idiosyncrasies of the antigens are well known.—U. F. RICHARDSON.

See also absts. **684-686** (avian coccidiosis).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

REMLINGER, P., & BAILLY, J. (1942). Action de la dessiccation sur quelques ultra-virus neurotropes. **[Action of Desiccation on some Neurotropic Viruses].**—*Ann. Inst. Pasteur.* **68.** 153–156. **552**

The viruses of rabies, pseudorabies and equine encephalomyelitis can be preserved in nervous tissue by rapid and complete desiccation. Viruses thus treated resist temperatures slightly above 100°C. for several minutes.—ISOBEL W. BURTON.

MORGAN, E. (1943). **The Origin and Spread of Infection. [Correspondence].**—*Vet. J.* **99.** 203–204. **553**

M. questions the possibility of birds acting as carriers of foot and mouth disease. He states that on the Continent of America, two Republics [names not given] remain free of the disease, notwithstanding the fact that they adjoin other Republics where the disease is prevalent, and despite the daily crossing of millions of carrion-eating birds, such as vultures and buzzards, from the infected to the uninfected Republics.—N. J. S.

*PIÉROT, M. (1941). Les conséquences fâcheuses d'une alimentation du bétail avec les résidus industriels surazotés. **[Results of Feeding Cattle on Nitrogen-Rich Industrial Residues].**—*Rec. Méd. vét. exot.* **117.** No. 6. [Abst. from abst. in *Schweiz. Arch. Tierheilk.* **85.** 261]. **554**

P. repeats his theory [see *V. B.* **9.** 309, and **10.** 508.] that the feeding of cattle with highly nitrogenous concentrates (such as ground-nut cake) derived from industrial residues increases the severity of foot-and-mouth disease when they become infected, and suggests that reduced feeding of such concentrates, caused by wartime economic conditions, has resulted in the development of a benign form of the disease.—D. G. G.

SCHOENING, H. W. (1942). **Rabies.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 191–196. **555**

Available data appear to indicate that rabies is widespread throughout the U.S.A. and the failure of control measures must be attributed to a lack of vigour in enforcing them. Vaccination can only be considered as an aid to control. Immunity following vaccination is only relative, but the resistance of certain animals can be raised by this means.

Some vaccine tests in which rabbits were used are described. Commercial vaccines are killed by phenol or chloroform and, in the official U.S.A. test, vaccines must be injected subdurally into rabbits as a test for the presence of living virus. Unfavourable reactions are infrequent in vaccinated animals. Judging from experiments, the danger from infection by ingestion of the milk of rabid cows is remote. Experiments to show the distribution of fixed rabies virus in the brain of the horse and rabbit are described. Reports of apparent recovery from rabies are referred to.—S. J. GILBERT.

WEBSTER, L. T. (1942). **Rabies Vaccines.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 201–202. **556**

The Swiss mouse has been found a useful experimental animal for potency tests for rabies virus, as the animal is naturally susceptible and undergoes the classical type of the disease under various test conditions. In a number of tests of commercial vaccines, no phenolized preparation immunized mice, whereas chloroformized preparations from two commercial firms did so in certain conditions. Comparative tests in dogs are now being carried out. No evidence has been found that commercial single dose canine vaccines immunize either dogs or mice.—S. J. GILBERT.

DONATIEN, A., & LESTOQUARD, F. (1941). Pouvoir antigénique de divers virus claveleux. **[Antigenic Power of Different Strains of Sheep Pox Virus].**—*Arch. Inst. Pasteur Algér.* **19.** 304–307. **557**

As the result of passaging the virus of sheep pox by inoculation during the years 1925–36 it has been concluded that a fixed virus stage is never reached, but that each virus has an individuality in respect of the number of passages required to attenuate it. In the course of attenuation by subinoculations, the viruses first show extreme virulence, pustules being formed after intradermal inoculation in spite of the use of large doses of antiserum. After a variable number of passages the virulence becomes modified, so that the use of antiserum prevents pustule formation, and sensitization of the virus allows its use as a vaccine. Later, the virulence becomes negligible.

In order to test the antigenic qualities of viruses in the various stages, antisera were prepared against two modified viruses, three virulent viruses, and one virus which exhibited irregular qualities, varying from virulent to modified at different passages. All the antisera gave approximately equal results when used to control the severity of virus inoculations.—U. F. RICHARDSON.

GLOVER, R. E., & ANDREWES, C. H. (1943). **The Antigenic Structure of British Strains of Swine Influenza Virus.**—*J. comp. Path.* **53.** 329–341. **558**

The results are given of neutralization and vaccination experiments in which British strains of swine influenza virus were compared with human influenza A strains and with Shope's porcine virus, strain 15. In addition, the viruses and their corresponding antisera were tested by the chick red-cell agglutination test of HIRST [*V. B.* **12.** 379]. No final conclusions were reached, but it appeared that neither of the two strains of swine influenza virus examined was more closely related to the other or to the Shope virus than it was to the human A (PR8) virus. During the experiments, strains of British swine influenza virus were established successfully in the ferret and the mouse. Vaccination

of mice showed that homologous vaccines were much more effective than heterologous ones.—D. D. Ogilvie.

Scully, S. (1943). Influenza del cerdo o "Hog-Flu". [**Swine Influenza**].—*Gac. vet., B. Aires.* **5.** 68–78. **559**

A general account of the European and American types of swine influenza, including descriptions of the causal agents, clinical features, morbid anatomy, experimental pathogenicity, immunity, and the relationship to human influenza. No new findings are reported.
—Isobel W. Burton.

Bang, F. B. (1943). **Synergistic Action of *Hemophilus influenzae suis* and the Swine Influenza Virus on the Chick Embryo. II.**—*J. exp. Med.* **78.** 9–16. [For previous article, see *V. B.* **13.** 283]. **560**

In continuation of a previous investigation, developing eggs were inoculated with swine influenza virus with or without living or dead cultures of *H. influenzae-suis*. It was found that the bacteria caused the virus to spread from the chorio-allantoic membrane to the allantoic fluid, thus increasing the titre of the virus, whilst the proportion of embryos killed by the mixture was appreciably higher than amongst those exposed to virus or to bacteria alone. Extracts of *Haemophilus* prepared by freeze-drying and filtering were also effective. Strains of pasteurella or the gonococcus were incapable of enhancing the virus.

Purified preparations of hyaluronidase induced a significant rise in the titre of virus in the allantoic fluid, but did not increase the mortality amongst the embryos as effectively as did *Haemophilus*, which was about 16 times as potent; moreover, the enhancing effect of hyaluronidase was almost entirely destroyed by boiling for 30 min., whereas *Haemophilus* extracts were unaffected.—R. E. Glover.

Hirst, G. K. (1943). **Adsorption of Influenza Virus on Cells of the Respiratory Tract.**—*J. exp. Med.* **78.** 99–109. **561**

In order to study the reaction of pulmonary cells to influenza virus, perfused ferret lungs were exposed to infected mouse-lung filtrates introduced through the trachea (both virus A and virus B were used). Samples of fluid were then removed at intervals and tested for virus content. It was necessary to eliminate all blood from the organ since ferret red cells, like chick erythrocytes, are agglutinated by and adsorb the virus. It was found that after 5 min., over 99% of the virus had disappeared from the inoculum, but that three hours later an appreciable amount had reappeared: thence-forward, each sample became progressively more active until the lethal titre was almost back to its original level. As is the case with chick red cells, the adsorption of B virus (Lee strain) was slightly delayed, but the elution phase was more rapid and complete than with PR8. Similar results were obtained in the mouse and the rabbit. When heat-inactivated virus was used, adsorption occurred but elution, checked by the haemagglutinin reaction, did not occur.

On the other hand, when concentrated virus was introduced into the lungs of anaesthetized living ferrets, the virus was not only rapidly fixed to the pulmonary tissues, but was not released in significant amounts after eight hours. It was found in appreciable quantities after 24 hours.

It is postulated that influenza virus particles become attached to the cell through the intermediary of specific receptor substances. In order to infect the cell, this receptor substance must be altered or destroyed —possibly by means of an enzyme—after which the virus parasitizes the cell, multiplies, and finally escapes to repeat the process.—R. E. Glover.

Bodily, H. L., Corey, M., & Eaton, M. D. (1943). **Precipitation and Concentration of Influenza Virus with Alum.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 165–168. **562**

Influenza virus contained in infected allantoic fluid can be precipitated by the addition of 10% alum, if necessary buffered to pH 6·0–6·5 with sodium bicarbonate solution, and then concentrated by elution from the precipitate with 20% sodium citrate. In 10 out of 14 experiments on PR8 virus, yields of 80% or over were obtained. An even higher recovery was obtained when the virus was first concentrated by adsorption on chick red cells, followed by elution into a small bulk of normal saline solution, prior to the addition of the alum.

Formalinized alum-precipitated virus induced a good immunity in mice and also stimulated very definite antibody responses when inoculated subcutaneously into human volunteers.—R. E. Glover.

Hare, R., McClelland, L., & Morgan, J. (1942). **A Method for the Concentration of Influenza Virus.**—*Canad. publ. Hlth J.* **33.** 325–331. **563**

Following the observation that allantoic fluid from chick embryos inoculated with influenza A virus formed a precipitate when frozen and allowed to melt slowly without agitation, the authors devised a method whereby the virus in such fluid could be concentrated 2–20 times. For determining the presence of virus, the method of adsorption on the red cells of chicks, previously described by Hirst [*V. B.* **12.** 379.] was employed.
—L. M. Heath (Canada).

Kubes, V., & Gallia, F. (1942). Fenómeno de para-inmunidad entre los virus de la encefalomielitis equina y de la rabia paralítica de Venezuela. [**A Para-Immunity Phenomenon Between the Equine Encephalomyelitis and Paralytic Rabies Viruses of Venezuela**].—*Bol. Inst. Invest. vet., Caracas.* **1.** 81–100. [English summary]. **564**

No cross-protection was demonstrated between native strains of paralytic rabies and E.E. viruses. A low-grade, non-specific immunity, however, was set up by vaccines prepared from each strain, which manifested itself in the form of a slight lengthening of life in vaccinated mice injected with the heterologous virus. This non-specific reaction was due to the virus antigens contained in the vaccines and not to the tissue proteins.

In vitro serum tests failed to reveal any evidence of cross-neutralization.—Isobel W. Burton.

Gwatkin, R., & Moynihan, I. W. (1943). **Recovery of Equine Encephalomyelitis Virus (Western Type) from Human Spinal Fluid in Alberta.**—*Canad. J. publ. Hlth.* **34.** 166–170. **565**

The first report of the recovery of E.E. virus (Western type) from man in the Province of Alberta, Canada. The history of the patient, who made an uneventful recovery, is also given. The interesting part of the report was the finding of both virus and neutralizing substances in a single sample of spinal fluid collected from the patient on the 10th day of illness. The virus was recovered from one of two g. pigs inoculated intracerebrally with the spinal fluid one day after its collection, while the test for neutralizing substances was made against Western type virus of equine source after the spinal fluid had stood at refrigeration temperature of about 8°C. for seven days. Serum from blood collected at the same time as the spinal fluid and maintained under like conditions also neutralized virus of the same type and origin.—L. M. Heath (Canada).

Gold, H., & Hampil, B. (1942). **Equine Encephalomyelitis in a Laboratory Technician with Recovery.**—*Ann. intern. Med.* **16.** 556–569. **566**

This case was observed and noted from the time when the patient became infected with Western E.E. virus, by the splashing of material from an infected egg into the eye, until his return to work nearly three months later. The virus was not recovered from the patient, but specific neutralizing antibodies in high titre were demonstrated in the blood. Large quantities of immune horse serum were administered to the patient in an attempt to minimize the effect of the virus.—J. C. B.

MITCHELL, C. A., & WALKER, R. V. L. (1943). **Infectious Anaemia and Encephalomyelitis Vaccination.**—*Canad. J. comp. Med.* **7.** 136–137. **567**

In the course of experiments with equine infectious anaemia, it was noted that animals inoculated with Western E.E. vaccine appeared more resistant against E.I.A. virus than unvaccinated animals. The question is raised whether there is any antigenic relationship between the viruses of the two diseases, it being hoped that other laboratories will check data bearing on this question.

STEIN, C. D., LOTZE, J. C., & MOTT, L. O. (1943). **Evidence of Transmission of Inapparent (Subclinical) Form of Equine Infectious Anemia by Mosquitoes (Psorophora Columbiae), and by Injection of the Virus in Extremely High Dilution.**—*J. Amer. vet. med. Ass.* **102.** 163–169. **568**

Experiments are described to determine whether E.I.A. can be mechanically transmitted either by mosquitoes or by the injection of the virus in high dilution. It was found that a subclinical carrier form of the disease could be transferred by *Psorophora* mosquitoes. Subcutaneous injection of virus in 1 : 100,000 dilution gave a similar result. Direct inoculation of blood from such subclinical cases was sufficient to cause active disease in susceptible horses.—D. D. OGILVIE.

PENHA, A. M., & D'APICE, M. (1942). Agalaxia contagiosa das cabras em S. Paulo. **[Contagious Agalactia of Goats in Sao Paulo].**—*Arq. Inst. Biol., S. Paulo.* **13.** 299–304. [English summary]. **569**

An adult goat in a herd of Toggenburgs developed agalactia in both halves of the udder. The animal gradually grew thinner, and died in a few months. At the same time, some kids were lost, and their deaths were attributed to pulmonary congestion.

From the liver of one of these kids, a micro-organism, morphologically and culturally resembling that of bovine pleuro-pneumonia, was isolated. It proved to be non-pathogenic for rabbits, g. pigs, mice, and rats, but produced localized oedema, fever, anorexia, and death on subcutaneous, intramuscular, or intravenous injection into kids.—ISOBEL W. BURTON.

PENHA, A. M., & D'APICE, M. (1942). Vacinação contra a peste suina com vacina mista de sangue e baço tratados pelo cristal violeta. **[Vaccination against Swine Fever with a Mixed Vaccine of Blood and Spleen Tissue Treated with Crystal Violet].**—*Arq. Inst. Biol., S. Paulo.* **13.** 217–231. [English summary]. **570**

S.F. vaccine was prepared by mixing one part of spleen pulp vaccine [see PENHA—*V. B.* **12.** 445.] with four parts of blood vaccine, the latter being made up as follows :– defibrinated blood, 1,000 ml. ; distilled water with 50% glycerin and 0·2% phenol, 1,000 ml.; 1% crystal violet solution, 100 ml. In this way, 170–200 doses of the mixed vaccine were obtained from each pig.

An intramuscular injection of 10 ml. was found to give a solid immunity against natural infection, lasting for more than 12 months.—ISOBEL W. BURTON.

REBELO, C. P. C. (1942). A vacina cristal-violeta na profilaxia da peste suina. **[Crystal-Violet Vaccine against Swine Fever].**—*Repos. Lab. Pat. vet., Lisboa.* **5.** 47–57. **571**

R. reports' good results from S.F. crystal-violet vaccination. Inoculated animals survived challenging doses of virus given 4–6 weeks after vaccination. The vaccine was found to retain its efficiency for at least 90 days after its preparation.—ISOBEL W. BURTON.

HEATH, L. M., & PLUMMER, P. J. G. (1943). **Distemper Studies in Foxes. I. The Experimental Inoculation of Foxes with Formalized Tissue of Infected and of Healthy Ferrets During an Epizootic.**—*Canad. J. comp. Med.* **7.** 163–174. **572**

All animals in a group of 99 cubs, whether manifesting symptoms of distemper or being apparently healthy, were inoculated. Over one-third received a formolized suspension of healthy ferret tissues, to serve as controls ; the remainder received a formolized suspension of infected ferret tissues. Two weeks later, in an endeavour to cut down losses, all cubs remaining alive were again inoculated with a formolized suspension of infected homologous tissue. Thirty-seven adults not previously treated were also inoculated with the virus inoculum ; three of these died suddenly three days later and the others remained unaffected. There were 14·5% more survivors among the originally healthy cubs inoculated with the formolized suspension of healthy ferret tissues than in the similar cubs inoculated with the suspension of formolized infected ferret tissues. On the other hand, the suspension of formolized infected ferret tissues was the only product employed capable of protecting ferrets against virus recovered from the outbreak. There was no evidence to suggest that the 10% frozen fish in the diet was *per se* responsible for the losses.

The P.M. findings in nine carcasses are described. Virus of low virulence for ferrets was recovered from dead cubs.

Inclusion bodies were demonstrated in tissues of only three of six foxes examined histologically.

EVANS, C. A., YANAMURA, H. Y., & GREEN, R. G. (1943). **Intra-Ocular Virus Infections.**—*Science.* **98.** 45–46. **573**

Intra-ocular injection is suggested as a useful means of growing and demonstrating the presence of viruses. After injection of about 0·2 ml. of the virus of fox encephalitis into the anterior chamber of the eye, diffuse opacity of the cornea was evident on the third day. The eye was removed on the fifth day and the presence of inclusion bodies demonstrated in the endothelial cells of the cornea. Neutralization tests were carried out by injecting mixtures of serum and virus dilutions into the anterior chamber of the eyes and observing the results. When neutralization occurred, there was no reaction.—J. C. BUXTON.

PHILLIPS, C. E. (1943). **Haemorrhagic Enteritis in the Arctic Blue Fox. Caused by the Virus of Feline Enteritis. (Preliminary report).**—*Canad. J. comp. Med.* **7.** 33–35. **574**

P.M. findings in two fox pups, together with the facts that all pups on the ranch had been sick at some stage of their growth (50% mortality), and that a kitten had died there with a history indicating feline enteritis, suggested a possible relationship between feline enteritis and the fox malady. Cats and kittens were fed a small quantity of composite faecal samples from clinically affected foxes. Some died, showing clinical symptoms and P.M. lesions of feline enteritis, while one kitten responded to feline enteritis homologous serum ; an affected fox also recovered following

the use of such serum. P. considers that sufficient evidence has been found to identify the condition in the foxes as due to the virus of feline enteritis.
—J. L. Byrne (Canada).

Hilleman, M. R., & Gordon, F. B. (1943). **A Protective Antiserum against Mouse Pneumonitis Virus.**—*Science.* **98.** 347–348. **575**

A virus related to the psittacosis group was isolated by blind passage of lungs in white mice. It showed a marked similarity with other latent pneumotropic viruses of the mouse.

In view of the difficulties encountered in producing neutralizing sera against these viruses, the authors immunized fowls with infected mouse lung suspensions; parallel inoculations were made in rabbits. Relatively high-titre neutralizing and agglutinating antibodies appeared in the fowl sera, but practically none in those of the rabbits. The fowl sera also reacted with egg-propagated virus purified by differential centrifugation to give a visible *in vitro* flocculation reaction. The advantages of obtaining sera of good neutralizing titre for the differentiation of members of this group are discussed.—R. E. Glover.

Reynolds, F. H. K., & Pollard, M. (1943). **The Employment of a Rickettsial Vaccine for Antigen in the Diagnostic Complement-Fixation Test.**—*Amer. J. trop. Med.* **23.** 321–323. **576**

It has been found that the specific complement-fixing properties of a commercial exanthematic typhus vaccine, prepared from infected chick embryo, with epidemic typhus antiserum could be demonstrated even when diluted 1 : 5 with 0·85% saline and used in quantities of 0·1 ml.

The vaccine, when administered to man as a prophylactic measure, failed to produce complement-fixing bodies, but it is thought that this does not necessarily indicate a failure to produce immunity.—U. F. R.

See also abstr. **687** (neurotropic viruses), **591** (E.E. antiserum), **624**, **625**, **665** (equine influenza), **622** (virus abortion in mares), **640** (? virus in infective hepatitis), **595** (Vi bacteriophage).

IMMUNITY

Topley, W. W. C. (1942). **The Biology of Epidemics.**—*Proc. roy. Soc.* Ser. B. **130.** 337–359. **577**

In experiments on the effects of adding susceptible mice to infected stock, it was noted that with low rates of addition, the death rate showed wide fluctuations with occasional intermissions. As the rate of additions rises, the curve of mortality assumes an undulating form with no intermissions, the total population tending to a relatively constant level.

Dispersal of infected stock into relatively large groups has little effect, but if the groups are smaller the mortality is lowered, provided that the dispersal is carried out in the initial phase of an epidemic. The withdrawal of single individuals always lowers the mortality in the dispersed stock compared to that of the herd.

It was noted that there was no evidence of any change in the resistance of the hosts of a kind that would lead to fluctuations in mortality. The process of natural immunization leads to a change in the proportion of resistant and susceptible hosts exposed to infection. After a major epidemic, a stage may be reached when a high infection rate is balanced by a high level of herd immunity, but if a relatively large number of susceptibles gain access to such a herd, another major outbreak may occur in which some of the old survivors may be involved.

If the average risk of infection in a population is low, and newcomers are added in small numbers at a time, their numbers may become great before chance precipitates a new epidemic wave. It is probable that changes in the spatial distribution of the hosts, and changes in the proportion of susceptibles and resistants, account for many of the periodic fluctuations in prevalence of epidemic systems in which infection is spread by direct contact. Strains of organisms may vary from each other in their epidemicity and in their virulence, and the biological properties of infectivity and virulence are dissociable. Different strains or races within a host species also differ in their resistance to attack.

The biological system on which any endemic or epidemic prevalence depends is an unstable equilibrium shifting now to the advantage of the parasite, now to that of the host. As we reduce the frequency of effective contact, we reduce the mass of infective material on which the probability of further diffusion, in part, depends. If we can tip the balance far enough, the system itself will do the rest, and the disease will be reduced to negligible proportions, or may even disappear.—U. F. Richardson.

Jervis, G. A. (1943). **Forssman's "Carotid Syndrome". A Contribution to the Study of Anaphylactic Changes in the Nervous System from the Standpoint of Pathology.**—*Arch. Path.* **35.** 560–570. **578**

This is a study of the pathological histological changes occurring in the phenomenon of Forssman's "carotid syndrome", produced by injecting Forssman antibody into the right carotid artery of 50 g. pigs. Typical "Forssman syndrome" symptoms were observed. The animals died or were killed off at intervals from a few minutes to several days after the inoculation.

In the early stages there was marked dilatation of the blood vessels of the right half of the mid-brain and hindbrain. That a primary abnormal barrier occurred was shown by vital staining with trypan blue, which stained the right side of the medulla blue. Later, parenchymatous lesions were observed. These consisted of degeneration of nerve cells, chromatolysis, vacuolation, and circumscribed areas of demyelination.

Five other g. pigs were given a subdural injection; they showed marked symptoms and died within 24 hours. Histologically, there was congestion of the meningeal vessels and infiltration of the pia mater with leucocytes and lymphocytes. Ten g. pigs given intracarotid injections of a 5% suspension of starch showed only slight symptoms and only vascular changes were noted microscopically.

The parenchymatous lesions were considered to be anaphylactic in nature, due to the Forssman antibodies and Forssman antigens normally present in the tissues of the g. pig.

B. considers these findings to be evidence that scattered demyelinating lesions of the central nervous system can be experimentally produced at the site of an antigen-antibody reaction.—R. R. A. Coombs.

Spain, W. C., Gillson, R. E., & Strauss, M. B. (1942). **Comparative Immunologic Studies with Salivary and Epithelial Extracts of the Dog, Cat, and Rabbit.**—*J. Allergy.* **13.** 563–571. Discussion pp. 571–573. **579**

It is a common observation that individuals hypersensitive to animals frequently exhibit local skin reactions, urticaria, erythema, itching, etc. when licked or mouthed by pet animals. Evidence is presented in this paper to show that an antigen common

to the epithelial and salivary extracts can be demonstrated in the dog, the cat, and the rabbit. The possible presence of an extra antigenic fraction in the salivary extract is discussed. The authors suggest that, since household pets are continually licking their fur to clean themselves, the hair or fur must usually be contaminated with saliva, and hence it is the mixture of these two excitants rather than epithelium alone which causes the clinical symptoms in the animal-sensitive patient. Discussing the work reported above, one speaker suggested that horse saliva and epithelium might have a similar combined effect in individuals allergic to this species.—N. J. Scorgie.

Campbell, D. H. (1943). **Relationship of the Eosinophil Response to Factors Involved in Anaphylaxis.**—*J. infect. Dis.* **72.** 42–48. **580**

Histamine, cysteine, and especially acetylcholine were found to increase the eosinophile response in animals suffering from anaphylactic shock, but to have no such effect on normal animals. Adrenalin, which also reduces shock symptoms, reduced the rise in eosinophiles in animals with anaphylactic shock.

G. pigs sensitized with sheep serum coupled to diazotized arsanilic acid, and three weeks later given an intravenous injection of the hapten, produced no eosinophile response and were found to be refractory to anaphylactic shock for periods of 24 hours to a week, depending on the administration of the hapten, when injected with the homologous antigen.

The administration of blood, taken from an animal sensitized to ovalbumin and anaphylactic shock by an intravenous injection of 0·1 mg. of the antigen, to normal animals and animals sensitized to ovalbumin and keratin respectively, produced no rise in eosinophiles. Thus, C. was not able to find an " eosinophilotactic " substance in the blood of shocked animals.

A group of g. pigs were each sensitized to several antigens and after a period, each was desensitized to the several antigens in turn. At the beginning of desensitization to the first antigen the eosinophile count rose, then gradually fell as desensitization continued, but at the beginning of desensitization of the animals to the second antigen, the count rose and fell again. The reaction occurred each time until the animals had been desensitized to each of four antigens. This indicated that the fall in the eosinophile count in the latter period of desensitization was due to a neutralization of the hypersensitive state and not to depletion of the eosinophile reserves.—R. R. A. Coombs.

Shaw, G. E. (1942). **A Rapid Method for the Preparation of Precipitated Tuberculin.**—*Quart. J. Pharm.* **15.** 280–290. **581**

The use of ultrafiltration procedures and precipitating agents such as ammonium sulphate and metaphosphoric, sulphosalicylic, and trichloracetic acids for the preparation of purified tuberculin were investigated, the method of biological assay adopted being that advocated in Medical Research Council Memorandum 15 (United Kingdom). Direct precipitation of heated culture filtrates with metaphosphoric and sulphosalicylic acids was found to yield products of similar potency to those obtained with the more commonly used precipitating agents. The disadvantages of water-bath evaporation and ultrafiltration techniques are discussed and the following method of preparation is suggested as suitable for providing a basis for the specification of a standard tuberculin for all purposes :– trichloracetic acid precipitation of the filtrate obtained from steam-killed, autoclaved (120°C. for ¾ hour) synthetic medium cultures, followed by thrice-repeated precipitation with $(NH_4)_2SO_4$ at half saturation, re-solution, and dialysis to free of residual $(NH_4)_2SO_4$.—J. Lochiel McGirr.

Khatenever, L. M. (1941). Tulyarin kak preparat spetsificheskoĭ i ranneĭ diagnostiki tulyaremii. [**The Specific and Early Diagnosis of Tularaemia by the Use of Tularin**].—*Arch. biol. Nauk.* **61.** No. 2. 3–12. [English summary]. **582**

From his own experiences and from the published and unpublished reports of the All-Union Tularaemia Conference in 1939, Kh. considers the single intradermal allergic test with tularin (48-hour cultures grown on egg medium and killed by heating to 65°C. for 30 min.) to be reliable for diagnosis in laboratory animals and human beings of fresh, old and " expired " infection and also of latent and clinically unpronounced cases. In Kh.'s experience, the allergic test is specific and the results agree with those of the agglutination test. Infection may be detected 24–48 hours after the onset of the clinical symptoms, *i.e.* 6–10 days earlier than by the aggln. test. The local and general reactions vary and are occasionally severe, although Kh. believes that the degree of the reaction is no indication of the extent of infection but is due mainly to individual susceptibility, and to the dosage and concentration of the tularin. Since 1938, the tularin used has contained 100 million bacilli per ml. Kh. states that good results are yielded also with the percutaneous test with more concentrated tularin (500 million–2 milliard bacilli per ml.) and also with other antigens, such as lysates and formalinized antigen.

The allergic and aggln. tests are less reliable in human beings and in animals in cases complicated by brucella infection, owing to the fact that some strains of brucella and tularaemia bacilli possess common antigenic and allergenic properties. According to Gaĭskiĭ [All-Union Conference on Tularaemia, VIEM, 1939—report not available in United Kingdom], 5·5% of human beings with undulant fever give a positive reaction to tularin.

The paper also contains reports from veterinarians who took part in the tularaemia expedition. According to Uzunov, out of 27 sheep, two pigs, and three horses from the infected area only 12 sheep and one horse gave a negative reaction. Positive reactors to the allergic test also showed aggln. with tularaemia antigen in a dilution of 1 : 80–1 : 320. Eleven sheep with an aggln. titre of 1 : 20–1 : 40 gave a negative reaction to tularin. All the animals examined reacted negatively to the intradermal brucellysate test. Out of 39 cows examined, only three reacted to the tularin test ; these also showed agglutination in a dilution of 1 : 25 with both tularaemia and brucella antigens.

Olsuf'ev isolated *Pasteurella tularensis* from " winter " ticks, *Dermacentor pictus* [*? D. albipictus*] taken from animals and from pastures, and showed that the disease was transmitted to animals by these ticks. In a district heavily infested with ticks, 48 (31·3%) of 153 sheep reacted to the allergic and aggln. tests, whereas 47 sheep from a tick-free area were all negative reactors.—A. Moldawsky.

Coburn, A. F., & Kapp, E. M. (1943). **The Effect of Salicylates on the Precipitation of Antigen with Antibody.**—*J. exp. Med.* **77.** 173–183. **583**

Sodium salicylate modified the precipitation of proteins whether induced chemically or immunologically. The effect on specific precipitation is probably due to the inactivation of the antibody. The precipitation of normal rabbit serum by sodium tungstate was modified by sodium salicylate, which also partly inhibited the precipitation of horse serum euglobulin by a rabbit antiserum, at all levels of antigenic dosage. The amount of precipitate in the experiments was estimated by finding the nitrogen content of the precipitate by a standard micro-Kjeldahl procedure. The

same inhibitory effect was obtained by adding sodium salicylate to a system containing crystalline egg albumin and its antibody. In the "equivalence zone" of antigen and antibody, increasing amounts of salicylate produced a progressive decrease in the amount of precipitate. In the "zone of antibody excess", the salicylate was less effective in preventing precipitation.

The authors suggest that the inhibition is due to the action of the salicylate on the antibody, and record another experiment to test the effect of progressively reducing the amount of antibody on various levels of antigen egg-albumin dosage. Two antigen doses were set up with graded amounts of serum, and it was found that 0·62 millimols of salicylate had the same effect on the precipitate as the elimination of one-quarter of the total antibody.

The reaction between salicylate and antibody was found to be partly reversible, as shown by dialysing the salicylate off from a system which had shown inhibition of precipitation due to salicylate; a precipitate was then formed, but, by nitrogen estimation, this was shown to be only 55% of that formed by a control. Formed precipitates were partly redissolved following resuspension in the presence of salicylate, despite the fact that the antibody would have been already united to the antigen.

Other members of the "lyotropic series" of anions were tested for a similar property. Potassium thiocyanate and potassium iodide had a very slight inhibitory effect, but whether this involved the same mechanism as sodium salicylate was not determined.
—R. R. A. Coombs.

Etris, S. (1943). **A Comparison of the Antigenic Properties of Staphylococcal Vaccine, Staphylococcal Toxoid, and the Two in Combination.**—*J. Immunol.* **46.** 309–314. **584**

E. states that a combination of staphylococcal vaccine and toxoid has the advantages of both types of antigen and has, in addition, a complementary action on antitoxin stimulation.—A. R. Jennings.

Hecht, R., Sulzberger, M. B., & Weil, H. (1943). **Studies in Sensitization to Skin. I. The Production of Antibodies to Skin by Means of the Synergistic Action of Homologous Skin Antigen and Staphylococcus Toxin.**—*J. exp. Med.* **78.** 59–65. **585**

The authors describe techniques for the preparation of skin antigen suitable for intramuscular injection into rabbits, and of a soluble skin antigen for the precipitin test. A series of experiments showed that specific anti-skin antibodies could be produced in rabbits by the intramuscular injection of homologous skin antigen and the intradermal injection of staphylococcus toxoid. Homologous skin antigen, used alone, resulted in little, if any, antibody formation.—A. R. J.

Rosenthal, L. (1943). **Agglutinating Properties of *Escherichia coli*. Agglutination of Erythrocytes, Leucocytes, Thrombocytes, Spermatozoa, Spores of Molds, and Pollen by Strains of *E. coli*.**—*J. Bact.* **45.** 545–550. [Author's summary copied *verbatim*]. **586**

Some strains of *Escherichia coli* have been found to possess agglutinating properties against cellular elements of animal and plant origin: erythrocytes, leucocytes, thrombocytes, spermatozoa, yeast, spores of moulds, and pollen. A technique for the performance of the test and factors influencing the reaction are described. Among 70 studied strains 24 proved active. Comparison with other agglutinating factors (hemagglutinating bacteria of Thomsen, leucagglutinating toxins, basic dyes, phytoagglutinins) shows that agglutinins of *E. coli* most closely resemble the phytoagglutinins. The importance of the agglutinating properties of *E. coli* is briefly discussed.

deGara, P. F., & Angevine, D. M. (1943). **Studies on the Site of Antibody Formation in Rabbits Following Intracutaneous Injections of Pneumococcus or of Streptococcus Vaccine.**—*J. exp. Med.* **78.** 27–39. **587**

The antibody response of rabbits following single and repeated intracutaneous injections of pneumococcal or streptococcal vaccine showed three phases. (1) Within 5–12 days after the injection of either antigen, high antibody titres were noted in extracts from the site of inoculation (except in the case of repeated injections), the spleen, bone marrow, and the liver. The serum titre was negative or very low. (2) In the period 2–4 weeks after injection, the titres of the various organs and the blood serum were approximately equal. (3) After longer periods, the serum titre decreased more rapidly than the titre of extracts of the afore-mentioned organs.

The authors therefore conclude that antibodies are formed at the local site of inflammation and in those organs which fix antigen, namely the spleen, liver, and bone marrow.—A. R. Jennings.

Youmans, G. P., & Colwell, C. A. (1943). **Comparative Quantitative Studies of Guinea-Pig and Rabbit Anti-Hemocyanin Precipitates.**—*J. Immunol.* **46.** 217–223. **588**

Rabbits and g. pigs were immunized with whelk (*Busycon canaliculata*) haemocyanin, and quantitative chemical analyses of precipitates obtained by the interaction of antigen and immune serum, were made at various points throughout the precipitative reaction range. The amounts of specifically precipitable protein per ml. and the curve showing composition of the precipitate, as indicated by the ratio of antibody N to antigen N, were similar for both rabbit and g. pig antisera. Contrary to findings with other antigens, the Dean and Webb optimal ratio (*i.e.* the ratio by volume of antigen to antibody at the point of most rapid particulation) fell, not in the equivalence zone, but far in the region of antigen excess with both g. pig and rabbit haemocyanin antisera. Further, this ratio bore no relation to the antibody content of the sera used though ratios by volume at the mid-points of the equivalence zones paralleled the antibody content of the antisera used.—J. Lochiel McGirr.

Hershey, A. D. (1943). **Specific Precipitation. V. Irreversible Systems.**—*J. Immunol.* **46.** 249–261. [For previous parts, see *V. B.* **13.** 245]. **589**

Theoretical considerations, based on the lattice hypothesis and the assumption of antibody divalence, are utilized to derive equations relating to an idealized irreversible system of immune precipitation, the fundamental conception being that of irreversible adsorption combination of antigen and antibody with simultaneous precipitation of the resulting compounds. The theory is found to be inadequate to explain precipitation phenomena, the major reason for its failure being that the aggregation which leads to precipitation is much too slow a process to compete effectively with the rapid initial adsorption combination of antigen and antibody. H. concludes that any successful theory of precipitation must provide a mechanism whereby antibody combined with antigen in the initial adsorption reaction can be partially desorbed during aggregation, and suggests that the "restricted theory" which is based on the model of a semi-reversible lattice-system, affords a working hypothesis [see *V. B.* **13.** 245, abst. 1632].—J. L. McG.

BOGOMOLETZ, A. (1943). **Antireticular Cytotoxic Serum.**—*Brit. med. J.* Aug. 14th. 203. **590**

B. has prepared an antireticular cytotoxic serum which, he claims, has in small doses a stimulating, and in large doses an inhibiting, effect on the function of the physiological system of the connective tissue. The serum is produced in the horse by repeated injections of cellular elements of human spleen and bone marrow.

Therapeutically, a subcutaneous injection of 0·05–0·1 ml. of the serum is used. Many disease conditions for which it has been used are enumerated; the diseases being mainly those which involve a depression of the functions of the connective tissue, including slow-uniting bone fractures, slow healing, feebly granulating and infected wounds, general suppurative infection, certain infective diseases, stomach and duodenal ulceration, etc.—R. R. A. COOMBS.

LITTLE, P. A. (1943). **The Mouse-Protective Test as a Uniform Method of Assay for Antibacterial and Antiviral Sera.**—*J. Immunol.* **47.** 97–109. **591**

The potencies were tested of antisera, prepared in horses and cows against *Pasteurella multocida, Erysipelothrix rhusiopathiae, Clostridium chauvoei, Streptococcus agalactiae* [it is probable that the strain used was of human origin], and the Eastern and Western types of equine encephalomyelitis virus.

Before injection, the four double dilutions of serum that were used were each mixed with a standard amount of bacterial culture or virus suspension containing at least 10,000 M.L.D. The period of observation required following inoculation varied with the different organisms from 5–9 days. With all organisms, however, the protective endpoints were clearly discernible, and the mice receiving non-protective doses of serum died as regularly from infection with organisms requiring five days to kill as with organisms requiring only one day, and an orderly relationship between the date of death of the animal and the size of the non-protective dose of serum was demonstrated with all the infecting agents.—JOHN FRANCIS.

OLIVER-GONZÁLEZ, J. (1943). **Antigenic Analysis of the Isolated Tissues and Body Fluids of the Roundworm,** *Ascaris lumbricoides* **var.** *suum.*—*J. infect. Dis.* **72.** 202–212. **592**

Third-stage *Ascaris* larvae, recovered by Baermann extraction from the lungs of g. pigs, were placed in sera from rabbits fed with infective eggs and from rabbits injected with powdered adults of *A. lumbricoides*. Precipitates were formed around the mouth, excretory pore, anus, and cuticle of the larvae, and a large percentage were immobilized or killed. In contrast, no precipitates were formed around larvae in normal sera, there was no immobilization, and only a few larvae were killed.

Precipitin "ring" tests were carried out with antigens prepared by saline extraction of isolated cuticle, eggs, intestine, muscle, spermatozoa, and coelomic fluid of adult worms and sera from both infected and artificially immunized rabbits. All the antigens gave reactions, but the highest titres were recorded by the cuticle and egg antigens. In the infected rabbits, only the anti-egg antibody persisted as long as 44 days after infection, and this was still present 126 days after infection.

Sera from both infected and artificially immunized rabbits were used in absorption tests with each tissue antigen, such absorption being followed in each case by precipitin tests against each antigen, and by *in vitro* tests on the larvae. Only the homologous antibody was completely absorbed by each antigen, and only the egg antigen completely absorbed the *in vitro* activity of immune sera against larvae.

Specific tissue antisera were produced in rabbits by series of intraperitoneal injections of each of the tissue antigens. In precipitin tests such anti-tissue sera gave the highest precipitin titres with homologous antigens, the anticuticle and anti-coelomic fluid sera showing the greatest tissue specificity. Only the anti-egg serum was active *in vitro* against larvae.—D. G. GILMOUR.

WRIGHT, G. G., & OLIVER-GONZÁLEZ, J. (1943). **Electrophoretic Studies on Antibodies to** *Trichinella spiralis* **in the Rabbit.**—*J. infect. Dis.* **72.** 242–245. **593**

Electrophoretic studies of sera from rabbits infected with *T. spiralis* showed an increase in the proportion of γ-globulin as immunity to the infection developed. Reinfection when the proportion of γ-globulin had begun to fall from the peak level did not produce another increase. Antibodies against both larvae and adult worms were demonstrated in the γ-globulin by means of *in vitro* tests. No such antibodies were detected in the other electrophoretic components of these sera.

—D. G. GILMOUR.

SPURLOCK, G. M. (1943). **Observations on Host-Parasite Relations between Laboratory Mice and** *Nematospiroides dubius* **Baylis.**—*J. Parasit.* **29.** 303–311. **594**

Three highly inbred strains of laboratory mice were compared as to mortality after receiving a standard dose of infective larvae of *N. dubius*. One strain (A—W) showed 26% mortality after a dose of 100 larvae and 100% mortality after 500 larvae, whilst the other two strains showed no mortality. In the A—W mice *ante-mortem* symptoms comprised progressive emaciation, sensitivity to cold, roughness of coat, and diarrhoea, while P.M. findings included signs of severe anaemia in all abdominal organs, splenomegaly, and severe inflammation of the intestinal mucosa with haemorrhages into the lumen.

In further experiments, no elimination of worms was noted in any of the mice in the 7–8 months after infection, and there was no evidence of resistance to superinfection.

There was no significant difference between the three strains of mice regarding numbers of worms establishing themselves in month-old mice, about 90% of the larvae given doing so, but in five-month-old mice significantly more worms established themselves in the C–57 strain (90% of larval dose) than in the A—W strain (80%). This difference seemed to be associated with the time the larvae took to pass through the stage of encystment in the intestinal wall: this time was much longer in five-month-old A—W mice than in five-month-old C–57 mice. A similar but much less marked difference in time of encystment occurred between these strains in month-old mice.

From these results, it is suggested that the A—W strain is more resistant to infection than the C–57 strain, but more susceptible to the effects of the parasites. [This work is interesting in that it demonstrates experimentally differences between two genetically stable strains of mice in both susceptibility and resistance to infection with an intestinal nematode, and opens up possibilities of investigating further the genetical and physiological basis of such strain differences.]

—D. G. GILMOUR.

FELIX, A. (1943). **Experiences with Typing of Typhoid Bacilli by Means of Vi Bacteriophage.**—*Brit. med. J.* April 10th. 435–438. **595**

Examinations were made of 440 strains of typhoid bacilli isolated from cases in the United Kingdom by the Vi bacteriophage method of CRAIGIE & YEN (1938). Of the 432 strains that were Vi forms 363 (84·1%) were

successfully typed, while 69 (15·9%) were untypable or imperfect Vi forms. The remaining eight strains could not be typed because the cultures were O forms. In addition to the eight Vi-phage types of Craigie, four new types were identified. F. suggests exchange of cultures and phage preparations between workers in various countries to prevent confusion concerning nomenclature.

Bacteriophage typing is a reliable guide in epidemiological investigation of disease outbreaks. Chronic carriers are easily detected by this means, which is of the greatest importance in the control of the disease. —M. H. Kyaw.

See also absts. **505** (mastitis diagnosis), **576** (typhus diagnosis and immunization), **605** (trichinosis diagnosis in allergic patients), **508** (TB. vaccination), **556** (rabies vaccines), **551** (leptospira antigens), **557**, **558** (virus antigens), **567** (antigenic relations of E.E. and E.I.A.), **564** (cross-immunity of Venezuelan E.E. and rabies), **560** (hyaluronidase and S.F. virulence).

PARASITES IN RELATION TO DISEASE [GENERAL]

Porter, A. (1941). **Report of the Honorary Parasitologist for 1940.**—*Proc. zool. Soc. Lond.* Ser. B. **111.** 185–187. **596**

During 1940, owing to the depletion of staff, faeces of new or sick animals only were examined. Altogether 75 specimens of faeces were examined, from 22 hosts. Multiple parasitic infestations were frequently found. Among the protozoa isolated, *Balantidium* spp., and possibly *Entamoeba histolytica*, are said to have caused ill-effects in primates, and *Eimeria* spp. in birds. Among the helminths, species of *Enterobius*, *Oesophagostomum*, and *Necator* were a factor in the deaths of some primates.

Details are given of the treatment of the young gorilla " Moko " for multiple protozoan and helminth infestations. Treatment lasted for more than a year, and during that period one dose of 1 grain santonin and ¼ grain calomel was given and, later, two doses of " phenothiazole " [phenothiazine], the first dose being 15 grains. Death supervened and P.M. examination showed that death was due to the presence of large numbers of *Necator americanus* in the intestine. It appears that phenothiazine destroyed *Enterobius* spp. and strongyles, destroyed some oesophagostomes and damaged others, which were recovered alive from the faeces, had a strongly inhibitory action on the oviposition of oesophagostomes and the hookworm, but had no effect on the adult hookworm.

A pileated gibbon, showing frequent haemorrhages from the bowel, was also treated with phenothiazine. 206 adult *Enterobius* spp. were recovered from the faeces, as well as entamoebae, a *Dientamoeba*, and numerous balantidia. After death, numerous specimens of *Enterobius* were recovered from the small intestine.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Beklemishev, V. N. (1942). Itogi izucheniya chlenistonogikh—perenoschikov bolezneĭ za 25 let. **[Twenty-Five Years' Study of Arthropod Disease Vectors].**—*Med. Parazitol., Moscow.* **11.** No. 6. 18–35. **597**

This is a review on the development of Soviet medical entomology, and a survey of the main achievements and most important publications of the last 25 years regarding transmitters of various human and animal diseases, such as mosquitoes, midges, biting muscids, tabanids, fleas, lice, bugs, and ticks. Much research was carried out on their biology, geographical distribution, and mass control.

B. emphasizes the necessity for the creation of a unified organization in Russia for the study and control of all disease-transmitting parasites.—A. Moldawsky.

Kaufmann, W. (1942). **Auricular Scabies (Psoroptic Otacariasis) of the Rabbit.**—*Amer. J. clin. Path.* **12.** 601–605. **598**

A description of auricular scabies, due to *Psoroptes communis* var. *cuniculi*, that caused trouble in a rabbitry. The condition appears to have been allowed to spread until it caused serious losses. The methods of dealing with the outbreak are described in detail. Photomicrographs are shown. The methods of control and cure used were on conventional lines.—A. Milne.

See also absts. **539**, **540** (tsetse fly), **582** (vectors of tularaemia), **542** (of leishmania), **548** (of anaplasmosis), **549** (of equine piroplasmosis), **568** (of E.I.A.), **613** (of poultry eye-worm).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Günther, H. (1942). Geschlechtsunterschiede im Parasitenbefall des Menschen. **[Sex Difference in Human Parasitism].**—*Z. Parasitenk.* **12.** 678–690. **599**

G. has collected a large amount of data from the literature concerning the differential sex incidence of various human parasites. In general, there was little difference before puberty, but after puberty there was a higher incidence of *Ascaris*, *Enterobius*, *Trichuris*, *Taenia saginata*, *T. solium*, and *Echinococcus* in women, and of *Cysticercus cellulosae*, *Schistosoma haematobium*, and *Necator americanus* in men. Various reasons for these differences are discussed.—D. G. Gilmour.

Hompesch, H. (1943). Ueber die Verbreitung von menschlichen Eingeweidewürmern in verschiedenen europäischen Ländern. **[Incidence of Human Intestinal Worms in Various European Countries].**—*Zbl. Bakt. I.* (*Orig.*). **150.** 208–215. **600**

H. carried out direct faecal examinations on 96,044 adult male workers of European countries, excluding Germany. The beef tapeworm, *Taenia saginata*, was found in 16 of 43,921 Ukrainians, in 10 of 12,448 Poles, in 74 of 11,754 Croats, in 40 of 10,430 Italians, in 11 of 8,307 Belgians, in 3 of 5,925 Frenchmen, and in one of 629 Danes, but was not found in any of 2,381 Dutchmen and 132 Czechs. The pork tapeworm, *T. solium*, was found only in 3 Croats, 3 Italians, and one Belgian.—E. S.

Larsh, J. E., Jr. (1943). **The Relationship between the Intestinal Size of Young Mice and Their Susceptibility to Infection with the Cestode, *Hymenolepis nana* var. *fraterna*.**—*J. Parasit.* **29.** 61–64. **601**

A series of four experiments was carried out, in which white mice 26 days old received a series of ten daily subcutaneous injections of prolactin, the object being to increase the size of the intestines. When 37 days old, these mice were given by stomach tube a test dose of eggs of *H. nana* var. *fraterna*. At the same time a group of untreated mice of the same age and an older group were given a similar dose. Ninety-three hours after being infected, all the mice were killed and the numbers of developed cysticercoids in the villi were counted. The intestines of the prolactin-injected and normal mice of the same age were measured for length,

empty weight (after the removal of mucus), and length of villi (on at least 50 microscopic sections). This showed that the prolactin treatment had produced approximately a 15% increase in length, an 84% increase in empty weight, and a 21% increase in villus length. In all four experiments, the young control mice had a considerably smaller percentage development of cysticercoids than the older mice, but in three out of four experiments the treated young mice had percentage developments approaching those of the older mice. It is suggested that the increased susceptibility of the very young treated mice was due to the increase in intestinal size.—D. G. GILMOUR.

PELOURO, J. T. (1942). Subsídio para o estudo das parasitoses renais no cão. **[A Renal Parasite in a Dog].**—*Repos. Lab. Pat. vet., Lisboa.* **5.** 73–81. **602**

P. reports the presence of nematode larvae in the cortical substance of the kidney of a dog. The histological features of the organ were similar to those described by NIEBERLE in *Ascaris canis* (stated to be synonymous with *Dioctophyme renale*) infestation.

—ISOBEL W. BURTON.

—. (1943). **Legal Standing of Trichinosis in Pigs. Judgment First Canadian Case.**—*Canad. J. comp. Med.* **7.** 114–117. **603**

The article deals with an action by a husband and wife claiming damages against a packing company operating under Government supervision, and against a meat pedlar who purchased pork from the company and processed it into sausages. It was alleged that the wife became infected with trichinosis as a result of eating the sausages, and thereby had suffered permanent injury to her health.

The basis of judgement was that a packer cannot be held responsible for the presence of trichinae, since they are present in the hog before its death. Briefly, the evidence of the expert witnesses called was to the effect that a hog with trichinae in the encysted stage is not an unhealthy or diseased animal, and that its flesh is not unfit for food after being properly cooked.

—L. M. HEATH (CANADA).

RAPPAPORT, I. (1943). **A Comparison of Three Strains of *Trichinella spiralis*. I. Pathogenicity and Extent of Larval Development in the Musculature. II. Longevity and Sex Ratio of Adults in the Intestine and Rapidity of Larval Development in the Musculature.**—*Amer. J. trop. Med.* **23.** 343–350 & 351–362. **604**

I. Using carefully designed techniques, R. compared three strains of *T. spiralis* from different sources in three quantitative characters. Graded doses of definite numbers of larvae per gramme body weight were given to mice, and the survival time of each animal was recorded as precisely as possible. No significant differences were found between the three strains in lethal dose of larvae or survival time of mice at a given dose level. All animals which survived 60 days or more after infection were examined for the numbers of larvae encysted in the musculature, and the results in each group were expressed as the ratio of larvae recovered to larvae fed. Again no significant differences were found between the strains in this respect, and although considerable variations were met with in all dosage groups, there was no indication that the size of the larval dose had any influence on the number of larvae recovered.

II. An accurate technique is described for the counting of the numbers of adult worms in the intestines of mice. Two dosage levels of larvae were used for each strain; in each experiment a number of mice were infected and two animals were then killed every two days from the 4th–30th days after infection. The data studied included the number, percentage of original dose, and sex ratio of adults recovered from the intestine, and the proportion of larvae recovered from the musculature to the number of larvae fed. In general, there appeared to be little or no difference among the three strains in longevity and sex ratio of adults and in the rapidity of larval development. [The detailed results are of considerable general parasitological interest, and serve to emphasize the part that such accurate quantitative work can play in life-history and immunological studies.]—D. G. GILMOUR.

ARBESMAN, C. E., WITEBSKY, E., & OSGOOD, H. (1942). **Results of Intradermal Skin Tests with Trichina Antigen in Allergic and Normal Individuals.**—*J. Allergy.* **13.** 583–590. **605**

Intradermal tests with *Trichinella* antigens were performed on groups of allergic and non-allergic patients. The non-allergic group gave reactions in 7·4% of cases, and the allergic group in 22·6%, results being recorded 20 min. after injection. Those who reacted positively among the allergic group were more sensitive to the usual inhalants and foods which produce allergy than were those who reacted negatively.

The authors conclude that the value of the intradermal test for the diagnosis of recent infection with trichinosis is limited, particularly in allergic and atopic individuals.—D. G. GILMOUR.

I. —. (1936). **Report of the Punjab Parasitological [Research] Scheme for the Period September 1934 to September 1935.** pp. 10. Simla: Government of India Press. [8vo]. **606**

II. —. (1937). **[Report of the Punjab Parasitological Research Scheme for the Period September 1935 to September 1936].** pp. 19. Delhi: Government of India Press. [8vo]. **607**

III. —. (1938). **[Report of the Punjab Parasitological Research Scheme for the Period September 1936 to September 1937].** pp. 22. Simla: Government of India Press. [8vo]. **608**

IV. —. (1938). **Final Report of the Punjab Parasitological Research Scheme.** pp. iv+32. New Delhi: Government of India Press. [8vo]. **609**

I, II, and III are brief interim reports of each year's work; IV is a full report of the methods and results of the whole scheme, and includes all the essential parts of the previous reports, together with discussions, references to the literature, tables of correlations, etc. [A more concise paper based on this final report, with the addition of statistical analyses of the results, has already been abstracted (see *V. B.* **10.** 378.)]

The general plan of each year's experiments was the same: 24 calves and 24 sheep were bought in September and their degree of infestation with intestinal nematodes was estimated by daily faecal egg counts until mid-November. Then various cheap anthelmintics including preparations of indigenous plants were tried on groups of animals, their efficacy being determined from changes in the faecal egg counts. In January, the anthelmintic treatment was stopped, and feeding of special fodders was begun. One group received a balanced ration of *bhoosa* (wheat chaff), green fodder, concentrates, and salt, and the others received fodder either from normal areas, from a frequently waterlogged region (Deg Nullah) which had a history of much parasitic disease and in which leaching of mineral constituents of the soil was suspected, or from regions adjoining the Deg Nullah. All fodders were analysed for protein content and mineral content (as soluble ash). In June, all animals were artificially infected with large doses of *Haemonchus contortus* and

Oesophagostomum spp. The degree of resultant infection was estimated by P.M. examinations of some animals, by clinical manifestations, and by daily faecal egg counts.

Among the main results was the finding that, of those tested, the combination of copper sulphate and kamala was the best anthelmintic to be used on a large scale because of its cheapness, availability, effectiveness (90% reduction of egg counts), and harmlessness. Copper sulphate plus sodium arsenite was 58% efficient. There seemed to be no correlation between a low protein intake and resistance to parasitic infestation, despite the poor general condition of the animals in the low protein group, but a low mineral intake did seem to have an effect in lowering resistance to artificial infection.

—D. G. Gilmour.

*Leopold, E. (1941). [**Behaviour of *Haemonchus contortus* in the Stomachs of Dead Animals**].—*Közl. Összehas. élet- és kórtan Köréből.* **30.** 56. [In Hungarian]. [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 292]. **610**

Because of the difficulty, after a delay of more than 24 hours, of finding *H. contortus* in the stomach at P.M. examination, L. investigated the action of decay and digestive juices on the worms in stomachs removed from 50 infested animals. The stomachs were kept during the summer in the open, in the laboratory, in the incubator, in the cellar, and in the ice-box, and the viability of the contained worms was compared with that of freshly collected worms kept in physiological saline at temperatures of 0°, 10°, 27°, and 37°C. Whereas in physiological saline at 0°C. *H. contortus* died in two hours, and at 27°C. in eight hours, in stomach contents at 15°–20°C. it survived about 20 hours, but died immediately at higher temperatures. The worms disappeared from the isolated stomachs after a minimum of 30–40 hours, fragments being recognizable for some time longer. The eggs also disappeared after a few days, the action of the digestive juices being important in this case, since eggs could be demonstrated in the contents of the rectum after worms and eggs had completely disappeared from the stomach.

—E. R. Pariser.

Whitlock, J. H., Callaway, H. P., & Jeppesen, Q. E. (1943). **The Relationship of Diet to the Development of Haemonchosis in Sheep.** *J. Amer. vet. med. Ass.* **102.** 34–35. (1943). [**Erratum**].—*J. Amer. vet. med. Ass.* **102.** 226. **611**

The table of egg-counts referred to in the article [see *V. B.* **13.** 363.] is now printed, but the list of references is still not given. The figures in the table confirm the conclusions drawn by the authors in the text of the article.—D. G. Gilmour.

Andrews, J. S., & Maldonado, J. F. (1943). **Some Clinical Aspects of Experimental Esophagostomiasis in Cattle.**—*Amer. J. vet. Res.* **4.** 211–225. **612**

Healthy calves, weighing 70–280 lb., were infected with *Oesophagostomum radiatum* by the administration of doses of 20,000–260,500 infective larvae. The symptoms produced in these animals were essentially the same as those observed by other workers in calves with naturally acquired nodular worm infestation. The first definite symptom of disease shown by the calves was a sharp, definite rise of temperature on the 4th–5th day after infection, correlated with the penetration of the intestine by the third-stage larvae, followed by a second rise of temperature about the 10th day after infection, correlated with the exit of the fourth-stage larvae from the mucosa. The second characteristic symptom was a severe diarrhoea which began 4–23 days after infection and continued for periods up to 186 days. The diarrhoea persisted until the enteritis had resolved sufficiently for the intestine to resume its normal functions. A transient rise in the relative percentage of polymorphonuclear leucocytes was the third symptom, seen 2–3 weeks after infection and associated with the repair of tissues damaged by the larvae during their stay in the intestinal wall. Anaemia set in about three weeks after the period of infection and resolved spontaneously when the infection was thrown off. Little blood was found in the faeces, and it is thought that the anaemia was toxic in origin. Worm eggs did not appear in the faeces until 3–5 weeks after the onset of diarrhoea, thus making diagnosis difficult in the early stages of the disease. It was found that the number of worms recovered P.M. bore no relationship to the severity of the symptoms noticed. The weight gain per day in infected calves was about one-seventh that of controls and the stunting effect appeared to be permanent. The disease in cattle differs from that in sheep in the rarity of intestinal perforation by the parasites in cattle. This is probably due to the relatively thicker intestinal wall in the bovine.—T. E. Gibson.

Hutson, L. R. (Undated). **Miscellaneous Veterinary Research in Antigua, B.W.I. Part 1. Studies on Manson's Eye-Worm of Poultry. Part 2. Studies on Canine Filariasis.**—*Thesis, Toronto.* pp. 32. **613**

Part 1.—After a general introduction giving a description of *Oxyspirura mansoni*, its life-history and host specificity, H. describes experiments with the nematode. He studied the incidence of natural infestation in the cockroach, *Pycnoscelus surinamensis*, and found that both immature and adult forms carried the larvae of *O. mansoni* and that large, small, and encysted forms of the larvae could be distinguished. When fed to chicks, the large and small forms were found to be capable of producing eyeworm infection, but the cystic forms were not; the cysts were, therefore, taken to represent an earlier stage of development. Attempts were made to culture larvae for transmission experiments. Embryonated eggs picked out from the uteri of mature female worms were incubated in sterile water at room temperature, but no development took place. When the experiment was repeated, faeces from an eyeworm-free chick being added to the culture, large numbers of larvae were obtained on the second day. It was, therefore, presumed that some factor in chick faeces is required for the development of the larvae.

An attempt was made to transmit the infection to the common American cockroach, *Periplaneta americana*, by feeding faeces containing eggs of the eyeworm. Failure was probably due to faeces being unsuitable food for the cockroaches, since experimental infection was successfully carried out by the injection of hatched larvae into the abdominal cavity of the cockroach. The successful infection of the cockroaches was proved by the development of eyeworms in chicks fed cockroaches 60 days after the injection of larvae had been made.

Treatment of the disease is fruitless unless active measures are applied for the control of cockroaches. Removal of the nictitating membrane of the eye is advocated as a subsidiary control measure [see *V. B.* **9.** 634].

Part 2.—H. gives an account of the findings in five cases of disease in male dogs where *Dirofilaria immitis* infestation was associated with pustule or abscess formation in the region of the sheath. *Staphylococcus aureus* was isolated from the pustules in all cases, but this organism was found to be incapable of producing disease in dogs when unaccompanied by some condition causing devitalization of the invaded tissues. *Staph. aureus* was found to be present on the skin of the abdomen, scrotum, sheath, and sheath proper [presumably means on the skin and mucous membrane of the

sheath] in a large number of normal dogs. In all the five cases, larvae of *D. immitis* were found to be present in the peripheral blood and in the pustules on the skin of the abscessed area. It was considered that the disease arose by the direct inoculation of the devitalized tissues with *Staph. aureus* by the dog's scratching and biting, and that devitalization of the tissues was due to numerous mosquito bites and the presence of large numbers of the larvae of *D. immitis*.—T. E. Gibson.

See also absts. **593** (trichinosis), **592** (*Ascaris*), **594** (*Nematospiroides dubius*), **688** (phenothiazine), **705** (individual faecal examination).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Bloom, F. (1943). **Structure and Histogenesis of Tumors of the Aortic Bodies in Dogs. With a Consideration of the Morphology of the Aortic and Carotid Bodies.**—*Arch. Path.* **36.** 1–12. **614**

B. gives a detailed description of primary tumours in the region of the base of the heart in two dogs and presents evidence suggesting that they arose from the carotid bodies. This view was supported by the similarity of the finer cytological details and the arrangement of the cells in the normal aortic and carotid bodies of the dog, and also by comparison of the canine tumours with carotid body tumours in man: neoplasms of the aortic bodies in man have not been described, but it is possible that some mediastinal tumours may eventually be so classified. B. disagrees with Jackson's [*V. B.* **9.** 106.] view that "heart base tumours" in the dog are neuroblastic (sympathogonioma) and that they are related to the infectious venereal sarcoma of this species.

The paper contains a useful summary of work on the aortic and carotid bodies of animals, including numerous references.—E. G. White.

Blumenfeld, C. M. (1942). **Normal and Abnormal Mitotic Activity. I. Comparison of Periodic Mitotic Activity in Epidermis, Renal Cortex and Submaxillary Salivary Gland of the Albino Rat.**—*Arch. Path.* **33.** 770–776. **615**

Mitotic activity was determined by counting mitoses in 1,000 fields at a magnification of 1,000 diameters. Using male albino Wistar rats, B. found that mitotic activity in the submaxillary salivary gland, epidermis, and renal cortex showed a diurnal periodicity which was different for the three organs. Maximal activity in the epidermis occurred in the early morning, in the renal cortex during the afternoon and in the submaxillary gland during most of both the day and night. It is important to establish the "normal" mitotic activity of any organ or tissue if one wishes to determine whether the rhythm in neoplastic tissues differs from that in normal tissues. Such data are not yet available and therefore no conclusions as to mitotic rhythm in tumour tissue are permissible.

There was no correlation between mitotic activity in the three organs examined, nor between mitotic activity and body weight.—E. G. White.

Menke, J. F. (1942). **Further Experiments on the Extraction of a Carcinogenic Factor from Human Cancerous Tissues.**—*Cancer Res.* **2.** 786–793. **616**

An interim report from which no conclusions are drawn. Of 36 mice treated with whole extracts of primary mammary carcinomas from women, seven developed sarcomas at the site of injection. Negative results were obtained with extracts of breast tissue, whether or not a primary carcinomatous nodule had been present in the breast. None of various fractions prepared from the apparently active extracts was active. Of 12 animals treated with whole extract of a human osteogenic sarcoma, one developed a sarcoma at the site of injection.—Alastair N. Worden.

Hutner, S. H., & Zahl, P. A. (1943). **Action of Bacterial Toxins on Tumors. IV. Distribution of Tumor-Hemorrhage Agents Among Bacterial Species.**—*Proc. Soc. exp. Biol., N.Y.* **52.** 364–368. [For previous parts, see *V. B.* **13.** 325]. **617**

In a survey of 28 genera and nearly 100 strains of bacteria, the authors have previously shown that bacterial substances capable of inducing haemorrhage in implanted tumours are restricted to Gram-negative species. It was also shown that the haemorrhage-producing agents are closely associated with the toxic somatic O antigens. There is a close parallelism between the lethal and tumour-haemorrhagic properties of purified bacterial products and both activities are similarly inhibited by sulphonamides.

The authors have now studied 40 further bacterial species, using cultures killed with toluene and chloroform and injected intraperitoneally into mice bearing seven-day-old implants of mouse sarcoma 80. Almost all the Gram-negative organisms caused tumour haemorrhage, whereas all Gram-positive organisms examined, with the exception of *Listerella monocytogenes*, were without effect. Tumour-haemorrhagic activity was found both in pathogenic and non-pathogenic species, the latter including species of *Aerobacter*, *Pseudomonas*, and *Rhodospirillum* (photosynthetic).

It is of interest that although *Erysipelothrxr rhusiopathiae* might have been expected to produce tumour haemorrhage, it failed to do so, whereas *L. monocytogenes* was very active.

Since rough strains lack the O antigen, it is necessary to pay attention to the possibility of smooth-rough transformation: failure to take this precaution may account for discrepancies between the results obtained by different workers.—E. G. White.

de Carvalho e Silva, F. de S. (1942). Blastômas de aves. Disgerminôma (seminôma) do ovário de galinha. **[Avian Blastomas.—Ovarian Seminoma in a Fowl].**—*Bol. Soc. brasil. Med. vet.* **11.** 143–151. **618**

Description of a tumour weighing 150 g. in a 15-month-old hen.—J. G. Carr.

Taylor, L. W., Lerner, I. M., DeOme, K. B., & Beach, J. R. (1943). **Eight Years of Progeny-test Selection for Resistance and Susceptibility to Lymphomatosis.**—*Poult. Sci.* **22.** 339–347. **619**

This paper is an extension of earlier reports [Taylor & Lerner (1938), and Taylor & DeOme (*V. B.* **10.** 128.)] and presents further data on the incidence of the disease in families of fowls bred for resistance and susceptibility to lymphomatosis.

During the eight-year period 1933–41, the incidence of lymphomatosis in the susceptible line remained consistently above that of the resistant line. Whilst there was considerable variation from year to year in both lines, the incidence in the resistant line remained at about the same level as in the stock from which the line originated in 1933. It was shown that the maintenance of a high incidence in the susceptible line was not a result of inbreeding *per se*.

Crosses between the resistant and susceptible lines gave intermediate results. The incidence of lymphomatosis in the offspring of fowls which died from

lymphomatosis was no higher than that in the offspring of their full brothers or sisters which did not die.

The authors point out that with the methods at present available, the development of a completely resistant strain cannot be expected, but that progeny-test selection provides a means of keeping the incidence of the disease within reasonably low limits.—F. D. A.

DeOme, K. B. (1943). **Intraperitoneal Injection of Lymphomatous Nerve Tissue into Resistant or Susceptible Chickens.**—*Poult. Sci.* **22.** 381–394. **620**

The fowls used in these experiments were derived from the strains bred for resistance and susceptibility to lymphomatosis [see preceding abst.].

In each of the years 1938, 1939, and 1940, experiments were carried out in which fowls resistant and susceptible to lymphomatosis were subjected to three sets of conditions, and the resulting incidence of lymphomatosis was observed.

The incidence of lymphomatosis in the parent flock, which served as one group, was 16% in the resistant and 36% in the susceptible line. The incidence of lymphomatosis in an uninoculated group managed under different conditions was 24·6% in the resistant and 61·2% in the susceptible strains. Chickens inoculated by the intraperitoneal route with lymphomatous nerve tissue and kept under the same conditions as the latter groups developed lymphomatous lesions in 67% in the resistant strain and 83·2% in the susceptible strain. These figures represent the combined results of three sets of experiments which gave comparable results.

It is concluded that, at a given level of susceptibility, the incidence of lymphomatosis increased as the level of exposure increased and, conversely, at a given level of exposure the incidence of lymphomatosis increased as the level of susceptibility increased. The effect of increasing levels of exposure and susceptibility was cumulative.—F. D. Asplin.

Nelson, N. M., & Thorp, F., Jr. (1943). **Ocular Lymphomatosis, with Special Reference to Chromatism of the Irides.**—*Amer. J. vet. Res.* **4.** 294–304. **621**

Studies on White Leghorn chickens were carried out over a period of two years in an attempt to establish the pathology of ocular lymphomatosis. Results were based upon clinical, gross, ophthalmoscopic, and histological examination of affected and of apparently normal birds.

Early pathological changes were found to be inflammatory in nature but dependent on, or secondary to, an infiltration with lymphoid cells.

In the advanced or grey-eye stage, clinical diagnosis was based on colour alterations of the iris, together with the size, shape and immobility of the pupil, but colour changes of the iris alone were not considered sufficient evidence for clinical diagnosis of ocular lymphomatosis either in the early or advanced stages.

Detailed descriptions of the histopathology of the various structures of the eye are given. In general, the vascular tissues of the eye were involved with pathological aggregations of lymphoid cells, whilst the avascular tissues were not as a rule affected.—J. D. B.

See also abst. **689** (avidin treatment).

DISEASES, GENERAL

I. Dimock, W. W. (1943). **Horse and Mule Production.**—*Cornell Vet.* **33.** 182–197. **622**

II. Dimock, W. W. (1943). **Equine Abortion.**—*J. Amer. vet. med. Ass.* **102.** 282–284. **623**

I. Mainly a description of equine breeding hygiene covering heredity, nutrition, pregnancy diagnosis, injuries to vulva and vagina following parturition, abortion, and infections of the newborn. The most common infection of the genital tract of mares has been found to be streptococcal. Records of examination show that 25% of sterile mares harboured streptococci in the genital tract; 18% of all foetuses examined, and 25% of all foals examined which died from navel-ill and joint-ill, showed streptococcal infection. Conditions favouring the entrance of streptococci into the genital tract are dealt with, and a description is given of D.'s method for suturing vulval and perineal tears. Abortion due to *Salmonella abortus-equi* may be controlled by vaccination of the mare early in gestation. The characteristic features of virus abortion in mares are described; encouraging results have been obtained in the control of this disease by the use of a new liver-tissue vaccine.

II. A short account is given of the features in the differential diagnosis of equine abortion due to infection with *Salmonella abortus-equi*, streptococci, the virus of equine abortion, and to unspecific causes. [For detailed information regarding virus abortion, see *V. B.* **13.** 283, absts. 1879–1883. For other causes of abortion, see *V. B.* **13.** 24, abst. 158].—N. J. Scorgie.

Jones, T. C., & Maurer, F. D. (1943). **The Pathology of Equine Influenza.**—*Amer. J. vet. Res.* **4.** 15–31. **624**

This admirably illustrated description of the lesions in equine influenza is based on a study of 150 cases (141 naturally and nine experimentally infected) coming to autopsy at a remount depot. The disease occurred as an acute infection of the respiratory tract characterized by high fever, cough, rhinitis and frequent pulmonary involvement. Complications are common in young animals, the most frequent being suppuration of the submaxillary and pharyngeal lymph nodes: the authors, in fact, believe strangles to be secondary to equine influenza. The most serious complication of influenza is pneumonia and this is probably more common than is generally realized, for its diagnosis is often difficult, especially when consolidation involves only the lung apex. Purpura haemorrhagica is another common sequel.

Observations on the blood picture and on the clinical and epidemiological features of the disease are published elsewhere [see *V.B.* **14.** 8, abst. 46, and abst. 625 following]. It is not possible to review the authors' work on the aetiology of the disease, because a full account of their bacteriological studies and experimental transmission of the disease to healthy horses has not yet been published. Their view is that the disease is caused by a filtrable virus associated with streptococci. The latter were isolated from the lungs in 128 of 137 cases examined bacteriologically and, although not always obtained in pure culture, they were always the predominating organism. All the strains belonged to Lancefield's group C.

In the early stage of the disease, the lesions were confined to the nasal and turbinate mucous membranes and the associated submaxillary and parapharyngeal lymph nodes. The essential change was a catarrhal inflammation which later became purulent. The earliest lung lesions were seen after several days and occurred in the apical and ventral portions. There was distension of the interlobular, peribronchial, and perivascular lymphatics with a serous, fibrinous, and purulent exudate which later became organized and converted into fibrous tissue. This interstitial inflam-

mation is regarded as characteristic of equine influenzal pneumonia. In some cases, the interstitial character was masked by consolidation of the lung parenchyma. This process began at the apex of the lung, appeared later in the ventral portion, and finally spread throughout the organ, the dorsal part of the lung being the last affected and usually strikingly demarcated from the ventral and apical consolidated areas. The earliest exudate was haemorrhagic, but with later secondary bacterial infection there developed purulent foci, areas of liquefaction, and sometimes confluent abscesses. At an intermediate stage, the cut surface of the lungs was " patchy ", with various lobules in stages of red or grey hepatization and resolution. There was often a fibrinous pleurisy with a fibrino-purulent exudate. Pleural adhesions were common in the late stages.

Extension of the pleural changes to the heart sometimes took place and set up a pericarditis : other lesions in the heart included foci of myocardial degeneration and subepicardial, subendocardial, and myocardial haemorrhages, occasionally associated with secondary metastatic purulent foci. Other secondary lesions included cloudy swelling or focal interstitial infiltration in the kidney, purulent meningo-encephalitis with abscess formation, and an intense purulent meningitis and perivascular infiltration, degenerative changes in the liver, acute splenitis, iridocyclitis, and purpura haemorrhagica (14% of cases). The last complication was characterized by oedema and by haemorrhage and necrosis of the superficial muscles, nasal mucosa, and intestinal wall.—E. G. White.

Jones, T. C., & Jennings, W. E. (1943). **Equine Influenza and Related Respiratory Diseases in Horses —Epizootiological and Clinical Observations.**—*Army vet. Bull., Wash.* **37.** 218–230. **625**

A rather severe outbreak of respiratory disease starting in the autumn of 1939 and continuing until the spring of 1941 is described. Part of the depot concerned (the issue area) is used for the receipt, conditioning, and issue of horses which have been purchased. An entirely separate area is devoted to the breeding and rearing of cavalry horses.

The exact relationship of the various respiratory diseases is under study at the depot, but is still obscure. In this outbreak influenza, strangles, purpura haemorrhagica, and pneumonia were diagnosed on clinical grounds. Pneumonia and purpura are considered to be complications of influenza or strangles, and the authors appear to doubt whether the two latter diseases are really distinct.

The outbreak began with typical influenzal symptoms, but, later, complications developed and at the height of the outbreak strangles was common. Nearly 20% of animals were affected more than once during the outbreak, indicating that a strong immunity was not developed. On the other hand, only ten of a group of 496 seasoned army horses returned to the depot developed respiratory disease, and in them it was mild, despite the facts that they were exposed to severe infection and that young horses received from civilian sources nearly all developed respiratory disease which was often severe.

Horses affected with acute influenza were treated by the intravenous injection of 3 g. of neoarsphenamine in 30 ml. of distilled water. Apart from this, treatment was largely symptomatic ; no sulphonamide drugs were used.—John Francis.

King, W. S., & Moller, A. W. (1943). **Experiences of Air Bombardment in an Urban Area.**—*Vet. J.* **99.** 258–268. **626**

In the bombing of an area of London, 160 casualties occurred in 20 studs comprising 1,104 horses. Of these, 98 were fatal and 62 recovered. Twenty-six casualties (16%) were due to blast and all but two of these were fatal. Autopsies showed little except complete collapse of the lung. Shrapnel was responsible for 49 casualties (30%) and fire for 17 (11%). Injuries due to the collapse of buildings caused the most casualties (86 = 56%).

Horses which survived bombing did not appear to be affected mentally or in any other way even after repeated raids.

It is recommended that horses should be housed in single-storey stables distant from inflammable bedding and foodstuffs and should have constant attendance during air-raids.—D. D. Ogilvie.

—. (1943). **Recommendations on the Control of Diseases of Dairy Cattle to Meet Wartime Needs [Special Committee on Diseases of Dairy Cattle].**—*J. Amer. vet. med. Ass.* **102.** 437–448. **627**

A comprehensive picture is given of the attitude of veterinarians in the U.S.A. to the control of diseases of dairy cattle. The importance is stressed of adequate nutrition for the control of disease. The management of the calf, cow, and bull are dealt with at some length, reference to such diseases as contagious abortion, mastitis, and acetonaemia taking a comparatively secondary place.

In order to improve the fertility of bulls of breeding age, 5 g. of chloretone and 1–2 oz. of concentrated cod liver oil, given daily for periods of 2–3 weeks, is a treatment advocated. The former is said to increase the vitamin C content of the blood and semen.

Cows should be allowed a rest of 60 days following parturition and served at the first oestrus after this period ; each animal should be examined for pregnancy seven weeks after service. Heavy feeding during the dry period is considered to predispose to mastitis, a disease which accounts for 25% of the cows disposed of from farms. Suggestions are made concerning the rearing of calves and of supplements to their diet.

The recommendations for the control of the diseases met with are similar to those practised in this country.—N. S. Barron.

—. (1943). **Recommendations on the Control of Diseases of Sheep. [A.V.M.A.] Special Committee on Diseases of Sheep.**—*J. Amer. vet. med. Ass.* **103.** 75–79. **628**

It is pointed out that, by giving attention to disease problems in sheep, the veterinarian can assist in maintaining lamb, mutton, and wool production in the U.S.A. A comprehensive tabulation of the major causes of loss among sheep flocks is given and the importance of prophylactic measures and mass treatment of sheep is emphasized. Care should be taken that biological products are not improperly used. The nutrition of sheep must be adequately attended to.—G. B. S. Heath.

Mills, R. H. (1940). **Stiff Lambs.**—*Bull. Dep. Agric. Calif.* **29.** 13–15. **629**

Since the term " stiff lambs " refers merely to a single symptom and not to any special clinical entity, M. considers it advisable to discuss the condition under headings which relate to aetiologies rather than to symptoms. He recognizes four causes of the types of lameness in lambs, to which this term is commonly applied in the U.S.A. :- (1) a bacterium indistinguishable from *Erysipelothrix rhusiopathiae*, but not pathogenic to pigs ; (2) tetanus ; (3) " feed allergy " in old lambs ; this may be caused by many kinds of forage, and affects only a proportion of the animals of a flock ; (4) " feed allergy " in unweaned lambs on mountain ranges ; the allergen appears to be present in the ewe's milk. Methods are suggested for treatment and control of these diseases.—G. B. S. Heath.

HAYDEN, C. E. (1943). **Biochemistry in the Diagnosis of the Diseases of Small Animals.**—*Cornell Vet.* **33.** 85–103. **630**

Normal values for blood constituents are given for dogs, including cholesterol, bilirubin, phenols, etc. A list is given of pathological conditions in which variations are to be expected, and a limited number of actual analyses are reported for canine cases of diabetes mellitus (ten cases), nephritis (31 cases), renal rickets (three cases), and other conditions.—A. N. WORDEN.

RAIMO, H. F. (1941). Estudo das moléstias em aves do 1.° Concurso Anual de Postura, realizado no Parque Central de Avicultura do Departamento de Indústria Animal, em São Paulo. [**Incidence of Diseases in Fowls in the First Egg Laying Contest—Department of Animal Industry, Sao Paulo, Brazil**].—*Bol. Indústr. anim.* **4.** No. 1. 124–161. [English and French summaries]. **631**

Before being entered for this contest, all birds were examined, and certified free from pasteurellosis, salmonellosis, and massive infection with ecto- and endo-parasites.

During the contest, 42 deaths occurred among the 168 birds present, 24 of which were due to neurolymphomatosis. Other conditions responsible for death were, in order of importance, aspergillosis, coryza, visceral gout, retained egg, leucosis, laryngotracheitis, *Tetrameres* infestation, crop disease, pericarditis, haemorrhagic enteritis, and injuries. Twelve cases of "bumblefoot" were noted; staphylococci were isolated from all 12 and acid-fast bacilli were found in two cases.—ISOBEL W. BURTON.

MACHADO, A. V., & RANGEL, N. M. (1943). Cistos epidermicos em Gallus domesticus. [**Epidermal Cysts in a Hen**].—*Bol. Soc. brasil. Med. vet.* **12.** 9–12. [English summary]. **632**

A description of a 15-month-old hen with multiple epidermal cysts, varying in size from 1–5 mm., produced by invagination of the dermis. The cysts contained concentric layers of keratinized epithelium, and a few small feathers. There was also a coexisting dermatitis, with perivascular lymphocytic infiltrations which were especially numerous near the cysts. No parasites of any sort were found in the cysts. The cause of the condition remains undetermined.—J. G. CARR.

GOMORI, G. (1943). **Pathology of the Pancreatic Islets.**—*Arch. Path.* **36.** 217–232. **633**

This is a brief review, with abundant references, of the normal and pathological features of the islets of Langerhans. The subject is subdivided under three headings, *viz*, normal histology, response to various stimuli, and changes in disease. Careful consideration of the evidence shows that the β cells of the islets are of importance in the regulation of carbohydrate metabolism, but it is by no means proved that they secrete insulin or that the β granules represent their insulin content. Neoplasms with no demonstrable β cells have been shown to possess high insulin activity. Nothing is known of the function of the α cells.

This review contains a great deal of useful information concerning the islets in the dog and cat.—E. G. W.

BUU-HOÏ, & RATSIMAMANGA, A. R. (1943). Sur la production de lésions type tuberculeux par des acides gras synthétiques : α. α. disubstitués. [**Production of Lesions Resembling those of TB. by Synthetic α-α-Disubstituted Fatty Acids**].—*C. R. Soc. Biol. Paris.* **137.** 189–190. **634**

Following the suggestion that other materials resembling phthioic acid in structure may possess the same ability to cause the characteristic cellular reactions found in TB., the authors synthesized α,α-dimethylstearic acid, and found that intraperitoneal injections of 50 mg. per week into g. pigs caused monocytosis, a fall in haemoglobin, adhesions and formations resembling those caused by TB., and necrosis and giant-cell formation similar to the effects of TB. or phthioic acid.—J. G. CARR.

GARDNER, L. U. (1942). **Chrysotile Asbestos as an Indicator of Subtile Differences in Animal Tissues.**—*Amer. Rev. Tuberc.* **45.** 762–766. [Spanish summary]. **635**

Most mineral particles provoke tissue reactions limited to simple phagocytosis or relatively mild degrees of chronic inflammation; the response is similar regardless of host factors. Free silica in the form of quartz, flint, etc., is a much more potent stimulus than other mineral particles and excites lesions similar to those produced by the tubercle bacillus, but the reaction is not host- or organ-specific.

The asbestos minerals have a more specific action and, of these, chrysotile, a hydrated silicate of magnesium, was specially studied. Two or three months after the injection of this substance into the lungs of man, g. pigs, and white mice, the mineral fibres become coated with a mixture of albuminous substances and iron, forming the structures known as "asbestosis bodies". These bodies do not form in other organs of the above animals or in the lungs of white rats or dogs; they are occasionally observed in the lungs of rabbits and cats.

It is suggested that the differences in tissue response demonstrated in this study may be of significance to the general problem of host resistance to other irritants, such as the tubercle bacillus.—JOHN FRANCIS.

GROH, H. (1941). **The Distribution of Bracken in its Possible Relation to Bovine Haematuria in British Columbia.**—*Sci. Agric.* **21.** 703–710. **636**

Enquiry has been made whether British Columbia bracken (*Pteridium aquilinum* var. *lanuginosum*) is in any way related to the incidence of bovine chronic haematuria in British Columbia. The ecology of the bracken in areas surveyed is described. The authors say "The rather striking appearance of an association between redwater disease and bracken in the lower Fraser Valley, elsewhere in British Columbia and in at least some other countries, must be viewed in the light of the fact that cattle in other bracken territory, *i.e.*, in all of eastern North America, have never been known to be affected. Such differences as there are in the associated flora and in bracken itself in various regions, or in the flora of Fraser Valley upland and lowland, have not yielded correlations that would seem significant in relation to redwater".

Some details are given of the areas in British Columbia in which bovine chronic haematuria occurs.—L. M. HEATH (CANADA).

ROBB, A. D. (1943). **Ictero-Anemia in Growing Swine.**—*Vet. Med.* **38.** 271–274. **637**

R. reports that in stained blood smears from cases of the disease he has found bodies simulating those described by L. P. DOYLE [*V. B.* **5.** 127.], but these he considers to be artefacts, detectable quite as frequently in blood films prepared from normal pigs. Attempts to transmit the disease to healthy pigs by direct means failed, and a single attempt at transmission through infestation with lice (*Haematopinus suis*) was also unsuccessful.—ALASTAIR N. WORDEN.

GRAY, S. J., & BARRON, E. S. G. (1943). **The Electrophoretic Analyses of the Serum Proteins in Diseases of the Liver.**—*J. clin. Invest.* **22.** 191–200. **638**

In five patients with catarrhal jaundice, one with acute arsenical hepatitis, 12 with cirrhosis, and seven

with metastatic carcinoma of the liver, electrophoretic analysis of the serum proteins revealed an abnormality of two or more fractions in every case, although in eight patients with jaundice resulting from obstruction of the common bile duct by a stone, there were no changes. The most pronounced changes in liver damage cases were a large rise in the γ-globulin fraction and a fall in the serum albumin, while there was also a significant rise in the β-globulin fraction. In some instances, *e.g.* in three of the five cases of catarrhal jaundice, the total serum globulin and the albumin : globulin ratio, as determined chemically, were normal, but the changes described above were found to be present on electrophoretic analysis.—Alastair N. Worden.

Dible, J. H., McMichael, J., & Sherlock, S. P. V. (1943). **Pathology of Acute Hepatitis. Aspiration Biopsy Studies of Epidemic, Arsenotherapy and Serum Jaundice.**—*Lancet.* **245.** 402–408. **639**

A total of 61 liver punctures on human beings was made on 14 cases of epidemic hepatitis, 35 cases of jaundice developing during arsenotherapy for syphilis, and seven cases of serum jaundice (five of which resulted from mumps convalescent serum and two from serum transfusions).

There were no recognizable differences between the materials obtained from the three types of cases. The general picture was one of hepatic cell necrosis and autolysis (especially in the centres of the lobules), associated with leucocytic and histiocytic reaction and infiltration (greatest in the portal tracts). For descriptive purposes the cases have been graded as "zonal", "diffuse" and "mixed", the type usually being zonal in cases of jaundice persisting longer than two weeks. Diffuse types usually healed rapidly. No evidence was obtained that there exists a form of jaundice due to duodenal catarrh and obstruction of the common bile duct by mucus, the material being "in accordance with the mass of evidence pointing to hepatitis as the pathological basis of epidemic jaundice". There are 12 photomicrographs.—Alastair N. Worden.

Hoyle, L. (1943). **A Note on some Unsuccessful Attempts to Demonstrate a Virus in Infective Hepatitis.**—*Mon. Bull. Minist. Hlth emerg. publ. Hlth Lab. Serv.* **2.** 99–101. **640**

From a small outbreak of epidemic hepatitis occurring in the Northampton area during 1942–43, and confined to children and young adults, the following materials were taken for study : (1) blood serum and frozen-and-thawed blood clot from a child in the pre-icteric phase (second day of illness) ; (2) blood serum from a young adult as jaundice was beginning (third day of illness) ; (3) liver and spleen from the only fatal case (third week of illness) ; and (4) nasopharyngeal washings from a young adult as jaundice was beginning (fourth day of illness). Attempts were made to infect mice and g. pigs by various routes, to cultivate virus on the chorio-allantoic membrane of developing fowl embryos, to cultivate virus by the Maitland technique and to demonstrate virus by complement fixation. All results were negative.—Alastair N. Worden.

Ottenberg, R., & Spiegel, R. (1943). **The Present Status of Non-Obstructive Jaundice Due to Infections and Chemical Agents. Causative Agents, Pathogenesis, Inter-Relationships, Clinical Characteristics.**—*Medicine.* **22.** 27–71. **641**

This is a comprehensive review, based on nearly 200 original communications, and cannot be abstracted in detail. The following points are among those stressed :—(1) simple jaundice and acute infectious atrophy of the liver are not unitary diseases, but may arise from various causes ; (2) in many infections (*e.g.* yellow fever, leptospirosis) and following ingestion of many poisons (*e.g.* chloroform, inorganic arsenicals, acriflavine, sulphonamides), there is a lengthy clinically latent period, although liver damage may be developing during this time ; (3) a specific immunity results from several types of infectious jaundice, but apparent recovery from jaundice of chemical origin leaves the body more susceptible to further intoxications ; (4) there is little basis at present for considering "allergy" as the mechanism for liver damage from certain chemicals, *e.g.* cincophens and sulphonamides.—A. N. W.

Eriksson, K. (1943). **Hereditary Forms of Sterility in Cattle. Biological and Genetical Investigations. I.** pp. 155. Lund : Håkan Ohlssons Boktryckeri. [8vo] [In English]. **642**

This monograph is a more complete and detailed account of work previously published by E., alone or in conjunction with Lagerlöf [see *V. B.* **10.** 190, 361, 450, and **11.** 539]. The investigation was begun in 1935 because of widespread sterility in the Swedish Highland breed of cattle, improvement of which began at the end of the 19th century. Only improved strains of the breed were affected. The disturbance in fertility was manifested in both the male and female, and was shown to be due to hypoplasia of the gonads, which might either be uni- or bilateral. Unilateral hypoplasia in the bull is detectable shortly after birth, whereas the bilateral form is less easily distinguished. In heifers, hypoplasia can be clinically proved as soon as they are old enough to permit rectal examination of the ovaries (at 6–7 months old). The hypoplasia affects the germinal epithelium of the gonads, but not the interstitial testicular tissue in the male. Heifers with this bilateral hypoplasia usually exhibit a neutral character, with a less well developed pelvis than normal, the udder and teats also being clearly hypoplastic. In both sexes, there is complete sterility when there is bilateral hypoplasia ; the bull shows normal sex instinct, whereas the female never exhibits oestrus. With both sexes the animals are fertile when the hypoplasia is unilateral, although the fertility is somewhat lower than in normal animals. The improved breed of Highland cattle can be traced back to two foundation bulls, and analysis has shown that the great majority of the affected animals are inbred with one of these bulls. The degree of inbreeding at the time when the investigation commenced was not high, except in a few herds. Genetic analysis of the increased material now available for study shows that the hypothesis, previously put forward, that hypoplasia is due to two recessive genes does not hold good. The earlier one has been replaced by the hypothesis that hypoplasia is conditioned by a recessive, autosomal gene with incomplete penetrance. Evidence is given to show that the penetrance is genetically determined, and is probably also influenced by non-genetic factors, but the material available did not permit of a complete genetic analysis of the mechanism of penetrance.

Since 1937, hypoplastic bulls have been slaughtered, a Government subsidy being paid. In addition, voluntary culling of hypoplastic females has been widely practised, and from 1943 the use has been forbidden of bulls which are the progeny of cows with this hypoplasia. These measures have decreased the frequency of manifest hypoplasia of this type from 25·6% in the 1935 research material to 7·9% in that available latterly up to 1942. In the future, the decrease in the frequency of the condition will progress more slowly the lower it becomes. While it will not be possible to eradicate the condition quickly, the frequency will soon have been reduced to such a low value that it will be of relatively little practical importance as a cause of sterility.

—N. J. Scorgie.

STURKIE, P. D. (1941). **Studies on Hereditary Congenital Baldness in the Domestic Fowl. I. Embryological and Physiological Bases of the Character.**—*J. Morph.* **69.** 517–535. **643**

Congenital baldness results from the formation of blebs filled with fluid over the cerebral hemispheres and eyes of embryos of 10–11 day development. The location is unilateral, bilateral, or median. Blebs begin development at eight days, reaching maximum size at 11 days and being reabsorbed by the 15th–16th day. The fluid separates the skin layers, so preventing growth of the papillae necessary for feather formation.

The condition is considered to be hereditary due to a recessive gene whose penetrance is incomplete, the primary effect being the formation of the blebs. Other workers have suggested (1) that cerebrospinal fluid is the source of the bleb fluid, and (2) that it results from ruptured blood vessels or from excessive filtration of normal vessels, but S. disproves these theories and concludes that the fluid is most likely to be a consequence of the separation of the skin layers due to inherent defects of the epidermis, created by the recessive gene, the fluid from the undifferentiated mesenchyme underlying the blebs flowing from the mesenchyme to the limits of the new epidermal boundary.—J. D. BLAXLAND.

HARMAN, M. T., & NELSON, F. (1941). **Polydactyl Feet of Two Strains of Chicks.**—*Amer. Nat.* **75.** 540–549. **644**

The purpose of this investigation was to determine and to classify the variations which occurred in two strains of polydactyl chicks. One of these strains, in which the hallux was usually duplicated ("duplicate polydactyl"), arose from a single White Leghorn hen. The other strain resulted from matings of individuals showing this type of polydactylism and from the regular strain of polydactyl birds; the polydactylism was usually manifested in one long hallux possessing a metastarsal, and either three or four phalanges ("polyphalangeal polydactyl"). A total of 469 feet was studied. A large amount of variation occurred in both strains of chicks, but it was possible to group the feet of the duplicate polydactyl strain into six classes, and those of the polyphalangeal strain into three classes, based upon the number and arrangement of halluces in each foot and the number and arrangement of the phalanges composing each hallux. Never more than two metatarsals for the halluces of the duplicate polydactyl strain were present, and only one was present in any of the feet of the polyphalangeal strain.—N. J. SCORGIE.

LEÃO, R. L. (1942). Ectromelía bitorácica de poldro. **[Bithoracic Ectromelia in a Foal].**—*Bol. Soc. brasil. Med. vet.* **11.** 153–156. **645**

A brief description, with photographs, of a six-month equine foetus with complete absence of the forelimbs and an umbilical hernia covered by amniotic membrane instead of skin. The mating has been repeated to obtain evidence as to whether this is an inherited defect.—J. G. CARR.

See also absts. **714** (livestock diseases in Montana, U.S.A.), **716** (poultry diseases), **669** (sterility in cattle), **650**, **651** (in swine).

NUTRITIONAL AND METABOLIC DISORDERS

SWAN, L. C. (1943). **Veterinary Problems Arising out of Present Feeding Conditions.**—*Canad. J. comp. Med.* **7.** 108–111. **646**

A general paper in which vitamin- and mineral-deficient diets and unbalanced diets are discussed in relation to conditions met with by the practitioner. The deficiencies are due to shortages of certain products on the one hand and lack of knowledge on the part of the stock-owner regarding these supplemental foods on the other. Unbalanced diets are usually associated with attempts to force either growth or milk production.

—L. M. HEATH (CANADA).

RICHARDS, M. B. (1943). **The Dietary Factor in Reproduction and Lactation.**—*Brit. med. J.* Oct. 2nd. 418–419. **647**

A breeding experiment in rats was carried out to determine the effect on reproduction of supplementing a poor human dietary by additions of inorganic Ca and vitamin B_1, and to test the effect of dried yeast as a source of thiamine and other factors, and also to test the influence during the breeding period of an increased milk intake together with these supplements. The females, mated at 100 days of age, after being on their experimental diets from weaning, were carried through three successive matings. Marked beneficial effects resulted from doubling the intake of milk; the addition of Ca alone was much less effective than that of milk. Thiamine alone appeared to be of doubtful value, the percentage of stillborn offspring being very high; Ca plus thiamine gave better results than thiamine alone. The groups receiving Ca and yeast were much superior to the others in appearance and performance, while those receiving milk as well as Ca and yeast were quite comparable to control stock rats on adequate diets. Marked differences between the groups in regard to the condition of the does after lactation were noted, those receiving milk being very much less exhausted and of greater average weight.

It is concluded that these records indicate the importance of the diet in relation to breeding performance in animals in controlled environment.—E. M. C.

—. (1943). **Discussion on the Influence of Vitamins and Hormones on the Physiology and Pathology of the Ear, Nose and Throat.** [Speakers:—MELLANBY, E., GREENE, R., & MACBETH, R. G.]—*Proc. R. Soc. Med.* **36.** 621–626. **648**

MELLANBY described experiments on rickets, where vitamin D was supplied in the form of irradiated olive oil, and severe incoordination developed in puppies, young rabbits, and rats owing to lack of vitamin A. Examination of puppies showed that both the cochlear and vestibular divisions of the eighth nerve had undergone severe degeneration. Widespread degeneration was also found in other nerves and in some parts of the central nervous system. Section of the labyrinthine capsule showed an overgrowth of periosteal bone (cancellous in type) in various places, which caused pressure on the nerve and consequent degeneration. These pathological changes took place in puppies after 3–5 months on a vitamin A deficient diet, but two years may be required to produce incoordination in an adult dog. The bone hyperplasia appeared to be due to a derangement of osteoblastic and osteoclastic activity. Vitamin A seems to be required for the proper functioning of bone cells; in its absence, bone of abnormal shape and texture is produced, sometimes in areas where it does not normally occur, *e.g.* in the internal auditory meatus. In those areas the nerves are damaged by the direct pressure of the hyperplastic bone.

GREENE stated that in otolaryngology the influence of hormones on the body cells is most evident in the effects on bone growth and on the mucous membranes.

Abnormality of the pituitary results in gigantism, acromegaly and pituitary dwarfism. In gigantism, an excessive amount of the growth factor is produced during the normal period of growth, and the long bones tend to be disproportionately long. Abnormal development of the sinuses may take place and this occurs also in acromegaly. In hypopituitary states, underdevelopment of the face and of the nasal sinuses is often seen. The anterior pituitary exerts an effect on the shape of the skull. Hypophysectomy in the young rat had been shown to retard the growth of the snout, the antero-posterior measurements being reduced though cranial height and width remained normal. The sex hormones exert an effect on the mucous membrane of the nose, which tends to become congested at or previous to menstruation. Rhinorrhoea and asthma may appear at this time, due to the fact that the nose is particularly sensitive. The causes of atrophic rhinitis are unknown, but they may be related to an abnormal effect of the anterior pituitary on skull growth. Hyperaemia, induced by oestrogens given either locally or generally, will alleviate temporarily the condition in the nasal mucosa, but does not effect a cure. Direct topical application of prostigmin is also effective, but the degree of improvement depends largely on the previous treatment of gross sepsis.

Macbeth discussed the effect of ascorbic acid administration in cases of repeated upper respiratory infections and in surgical cases which he described. In the former cases, administration of ascorbic acid (100–400 mg. daily for 10–14 days) effected cures and in the latter cases marked benefit resulted from premedication with ascorbic acid, operative and post-operative haemorrhage being appreciably reduced and recovery accelerated.—E. M. Cruickshank.

von Wendt, G. (1941). Carotin-Hunger. Beobachtungen und Feststellungen. **[Carotene Hunger in Cattle].**—*Z. Vitaminforsch.* **11.** 233–235. [English and French summaries]. **649**

It was observed in Finland in seasons when little hay and silage were available, that milch cows consumed with avidity the needles of pine, fir, and juniper. Low carotene values, about one-tenth of the normal, were found in the milk and butter under these conditions. The reason for the craving appeared to be that the cattle were suffering from carotene hunger, and were instinctively drawn to rectify the deficiency by ingesting conifer needles, which may contain more than 10 mg. % of carotene. When such animals were injected with vitamin A preparations the carotene hunger disappeared, to return again after some days. The author considers that vitamin A is of significance in combating infections. —E. M. Cruickshank.

*Lesbouyries, G. (1941). Avitaminose A du porc. **[Vitamin A Deficiency in Swine].**—*Rec. Méd. vét. exot.* **117.** [No. 6]. [Abst. from abst. in *Schweiz. Arch. Tierheilk.* **85.** 260]. **650**

L. points out that, in the light of experimental facts and clinical findings, several conditions of unknown aetiology occurring in pigs must be ascribed to vitamin A deficiency. Thus in the vitamin A deficient sow, abortions, stillbirths, and retention of placenta may occur, while in new-born and young piglets, ocular symptoms are most frequent, often associated with arrest of growth and with other troubles of central and peripheral nervous origin, such as motor incoordination, convulsions, and paralysis.

Cod liver oil, fresh greenstuffs, and especially access to pasture are recommended as treatment.—D. G. G.

Golyarkin, F. E. (1941). Vliyanie vitamina "A" na proyavlenie polovoĭ okhoty i razvitie ploda u svinomatok. **[Effect of Vitamin A on Swine Fertility and Foetal Development].**—*Dokl. vsesoyuz. Akad. sel'skokhoz. Nauk.* No. 9. pp. 33–36. **651**

Pigs are extremely sensitive to vitamin A deficiency which in lactating sows produces subsequent infertility; deficiency during early pregnancy causes abortion and malformation of the foetuses while deficiency during late pregnancy results in a high mortality among piglets 3–5 days *post partum*. Young sows are more susceptible than older ones. Complete absence of vitamin A is responsible for atrophy of the Graafian follicles and the degeneration of epithelium in the uterus and vagina, and in boars for degeneration of the seminal ducts.

On a large Sovyet pig-breeding farm (Sovkhoz), G. observed infertility, abortions, stillbirths, and malformations which were due to vitamin A deficiency during a drought period. Rapid improvement was observed after the administration of 10–30 ml. of cod liver oil daily, together with an adequate diet.

Vitamin A is provided in summer by green pasture and in winter by the addition to the diet of carrots, silage, beans, and vitamin flour.—A. Moldawsky.

Jones, T. L. (1943). **Chastek Paralysis on an Alberta Fox Ranch.**—*Canad. J. comp. Med.* **7.** 112–113. **652**

Chastek paralysis or vitamin B_1 deficiency of foxes [*V. B.* **13.** 181.] which occurred on an Alberta ranch maintaining approximately 1,500 foxes is reported. Symptoms of paralysis in one fox were first noted 44 days after the regular feed, which contained over 23% of fish (tullibee), had been changed to one containing approximately 11% Pacific Coast herring (*Clupea pallasii*). J. points out that the change coincided with the pelting season, when usually more food was prepared than was required for one day's feeding and was carried over from day to day, thus allowing the constituents of the diet to be exposed to the vitamin B_1 inactivating factor presumed to be in the herring.

After a vitamin B_1 rich diet replaced the diet containing herring, recovery of over 80 affected animals occurred within a month. No animal completely paralysed, however, recovered; five died and ten were killed *in extremis*. The administration of large subcutaneous doses of thiamine chloride on three successive days revived four animals manifesting advanced symptoms.—L. M. Heath (Canada).

Wintrobe, M. M., Follis, R. H., Jr., Miller, M. H., Stein, H. J., Alcayaga, R., Humphreys, S., Suksta, A., & Cartwright, G. E. (1943). **Pyridoxine Deficiency in Swine with Particular Reference to Anemia, Epileptiform Convulsions and Fatty Liver.**—*Johns Hopk. Hosp. Bull.* **72.** 1–25. **653**

In a direct continuation of earlier studies [see *V. B.* **13.** 367, abst. 2459, and 297, absts. 1968–1970.] the specific effects of vitamin B_6 deficiency were observed. The experimental methods were exactly as described in earlier papers, the deficiency being produced by withdrawal of crystalline vitamin B_6 from the vitamin supplement mixture.

A microcytic anaemia developed in 3–15 weeks, and became severe 2–4 weeks after onset. In extreme cases, haemoglobin values of 2·4 g. per 100 ml. and packed red cell volumes of 9 ml. per 100 ml. blood were recorded, while the mean corpuscular volume fell from 58 cu.μ (the average normal value given for the pig) to 40 cu.μ and below. Hypochromia was not marked, the mean corpuscular haemoglobin concentration rarely falling much below the normal value of 33%. As the anaemia developed, the serum iron content tended to rise, anisocytosis became marked, but poikilocytosis was rare. There were no constant changes in leucocytes or platelets. There was a striking improvement in the anaemia following treatment with vitamin B_6, but in

most cases the regression was never complete. Histological changes accompanying the anaemia included haemosiderosis in the spleen, liver, and bone marrow, and hyperplasia of the bone-marrow.

Convulsions developed in the majority of pigs, usually within 7–12 weeks of the start of the experiment.

The third major result of the deficiency was a fatty infiltration of the liver, which could be seen in the central portions of the lobules, and, in severe cases, in the mid-zonal regions also.—ALASTAIR N. WORDEN.

BISKIND, M. S., & BISKIND, G. R. (1943). **Inactivation of Testosterone Propionate in the Liver During Vitamin B Complex Deficiency. Alteration of the Estrogen - Androgen Equilibrium.**—*Endocrinology.* **32.** 97–102. **654**

Testosterone propionate and other androgens, as well as oestrogens, are normally inactivated in the liver. The experiments here reported show that deficiency of the vitamin B complex does not significantly impair the inactivation of testosterone propionate in the liver of the male rat. This is in contrast to the results previously obtained by the authors with oestrogens, the inactivation of which was found to be markedly impaired in vitamin B deficiency. Together with an absolute rise in the level of body oestrogen which thus results, a serious alteration must occur in the oestrogen-androgen equilibrium. Possible clinical consequences of these disturbances are discussed. Two of the syndromes in the female (menorrhagia and chronic cystic mastitis) as well as one in the male (deficient spermatogenesis and sterility) are stated to have been treated successfully with vitamin B complex. It is also pointed out that there is evidence that oestrogen administration can cause vitamin B deficiency, so that failure of the liver to inactivate oestrogen in vitamin B deficiency results in the establishment of a vicious cycle.—N. J. SCORGIE.

O'DELL, B. L., & HOGAN, A. G. (1943). **Additional Observations on the Chick Antianemia Vitamin.**—*J. biol. Chem.* **149.** 323–337. **655**

This investigation confirmed that, on certain rations, anaemia of the hyperchromic, macrocytic type develops and is due to the lack of a factor at present termed vitamin B_c. A diet containing casein, gelatin, dextrin, wheat germ oil, salts and all the hitherto known factors required for chick growth, including inositol, nicotinic acid, and biotin produced severe anaemia in 50% of the chicks. For the assay of B_c, day-old White Leghorn chicks were maintained on the above diet for three weeks, when determinations of the degree of anaemia were made at weekly intervals. A chick was not classed as anaemic until the red cell volume had reached the arbitrary value of 20% by volume. The addition of 0·25% of sulphaguanidine to certain of the basal rations tested increased the incidence of anaemia. It appeared that the factor is transmitted through the egg to the chick and that it is more abundant in green than in dry feeds. Vitamin B_c is insoluble in the common organic solvents. The aqueous extract of liver is one of the best sources of the vitamin.—E. M. C.

EVANS, E. E., NORWOOD, W. D., DEEPWATER, N. J., KEHOE, R. A., & MACHLE, W. (1943). **The Effects of Ascorbic Acid in Relation to Lead Absorption.**—*J. Amer. med. Ass.* **121.** 501–504. **656**

Study of a large group of lead workers showed that oral administration of 100 mg. ascorbic acid daily had no effect on the lead concentration in the blood or on the elimination of Pb in the faeces or urine, nor was any change found in the number of erythrocytes or stippled erythrocytes or in the Hb value. It is concluded that ascorbic acid does not minimize the effects of Pb absorption.—R. ALLCROFT.

See also absts. **715** (animal nutrition and veterinary dietetics), **709** (pasture improvement), **659** (rickets), **554** (diet in relation F. & M. disease), **609** (to helminth resistance), **689** (to control of neoplasms in dogs).

PHYSIOLOGY AND ANATOMY

BERTRAND, D. (1942). Le molybdène chez les animaux. **[Molybdenum in Animals].**—*C. R. Acad. Sci., Paris.* **215.** 590–592. **657**

Molybdenum was estimated in a number of animal species, both invertebrates and vertebrates, by a wet combustion method (the lower limit of accuracy being 0·002 mg. Mo per 100 g. dry matter) requiring 50–60 g. dry material [no other details of the method are given]. Mo was found present in all species examined, the average amount being about 2 mg. and 0·8 mg. per kg. dry matter respectively for invertebrates and vertebrates except for certain ascidians and *Plumatella fungosa* (a bryozoan) which were very rich in the element.—R. A.

SCHOENHEIMER, R. (1942). **The Dynamic State of Body Constituents.**—*Harvard Univ. Monogr. Med. publ. Hlth.* No. 3. pp. x+78. London: Humphrey Milford, Oxford University Press; Cambridge, Mass.: Harvard University Press. [8vo] [$1.75]. **658**

Under the general title "The Dynamic State of Body Constituents", three lectures are presented dealing with :– I, "The Reactions of the Body Fats Investigated with Deuterium"; II, "The State of the Body Proteins"; III "The Rôle of Structural Elements in the Formation of Excretory Products". The subject matter of the lectures gives an account of the use of isotopes in the study of metabolic processes, the results of which suggest that "all constituents of living matter, whether functional or structural, of simple or of complex constitution, are in a steady state of rapid flux". There is a good bibliography and an index.—R. A.

MØLLGAARD, H. (1943). Über die Einwirkung des Sulfidions auf die Resorption von Calcium und Phosphat bei wachsenden Schweinen. **[Influence of the Sulphide Ion on the Resorption of Calcium and Phosphate in Growing Pigs].**—*Biederm. Zbl. B. Tierernährung.* **15.** 1–26. **659**

Two groups of pigs born in winter, and one group born in summer, all weighing 18–20 kg., were fed $Na_2S.10H_2O$ in quantities ranging from 0·18–2·4 g. per day. While the digestibility quotient for N and Cl remained unaltered, the values for Ca, P, and Mg fell. The plasma Ca was also reduced, and the animals developed rickets and osteoporosis. The animals born in winter did not suffer to the same extent as those born in summer. Administration of 5,000 I.U. of vitamin D prevented this action of sulphide. A new staining method is also given for differentiating bone from osteoid tissue in sections.—J. G. CARR.

TARANENKO, G. A. (1941). Vliyanie vneshnikh faktorov na devatel'nost' molochnoĭ zhelezy korov. **[Effect of External Factors on the Udder of the Cow].**—*Dokl. vsesoyuz. Akad. sel'skokhoz. Nauk.* No. 3. pp. 26–31. **660**

Various experiments and observations were made on individual animals and on whole herds. In T.'s opinion, besides physiological and inherited factors, the milk secretion is influenced by a complex of conditional reflexes acquired by the cows in certain surroundings. He found that some psychological factors, such as changes in milking personnel and technique, rough

treatment, fright, and alteration of the accustomed surroundings considerably diminish the milk yield and that this loss is not made up by later milk yields.

Several examinations were made on the effect of external temperature on the milk yield. It was found that the milk yield of Shorthorns and Herefords, which are said to be particularly susceptible to heat, was 23% less, during hot days with a shade temperature exceeding 30°C., than it was for the same period during the night with temperature at 14–15°C. It was also found that the milk yield of herds milked exactly to time was considerably higher than that of those milked at irregular intervals.—A. MOLDAWSKY.

JONES, O. P. (1943). **Morphologic, Physiologic, Chemical and Biologic Distinction of Megaloblasts.**—*Arch. Path.* **35.** 752–775. **661**

This long article is partly a review and partly an exposition of J.'s views. J. is not in agreement with the theory of erythropoiesis put forward originally by DOAN, CUNNINGHAM, & SABIN (1925) and much of the article is devoted to a refutation of this theory. The article should be read in the original by those interested. —D. L. HUGHES.

BARRES, L. A. (1942). Sobre algunos valores en la composición química de la sangre de los bovinos. **[Chemical Composition of Blood of Cattle].**—*Bol. mens. Direcc. Ganad., Montevideo.* **26.** No. 3. 174–178. **662**

Blood sugar, urea, cholesterol, inorganic P, Ca, and alkaline reserve values are reported for 52 cattle of various ages and breeds. [Certain figures in the tables are incorrect.]—J. G. CARR.

WAKERLIN, G. E. (1943). **Normotension and Hypertension in the Dog.**—*J. Amer. vet. med. Ass.* **102.** 346–351. **663**

Methods of determining blood pressure are described. Sphygmomanometry by the direct method in dogs is the technique most commonly used by research workers; few have used the indirect auscultatory method [but see also ALLEN—*V. B.* **13.** 114, abst. 764.]. Adequate comparative studies of the two procedures on the dog have not so far been published. The facts available suggest that the direct method is more reliable for routine clinical examination of dogs.

Considerable variations are found in the blood pressure of healthy dogs. By the direct method, the mean femoral artery pressures of several hundred resting dogs varied from 90 mm. Hg. to 150 mm. Hg. with a mean of 120 mm. Hg.; the majority varied from 110–140 mm. Hg. By the indirect auscultatory method, readings of brachial artery pressures of nearly a hundred dogs indicated an average of 140 mm. Hg., with a range of 100–180 mm. Hg. for the systolic pressure and an average of 90 mm. Hg. with a range of 60–120 mm. Hg. for diastolic pressure.—J. A. GRIFFITHS.

ROCHE, J., & DERRIEN, Y. (1942). Solubilité et caractères spécifiques des myoglobines (hémoglobines musculaires) des mammifères. **[Solubility and Specific Character of Myoglobin of Mammals].**—*C. R. Soc. Biol. Paris.* **136.** 41–45. **664**

Pure myoglobin was prepared from cattle, horse, and dog tissue. Only the first two yielded a crystalline product. Solubility tests indicated that the three materials were chemically distinct entities.—J. G. CARR.

UTTERBACK, J. A. (1943). **Fluid Balance Mechanism in Health and in Shock.**—*Army vet. Bull., Wash.* **37.** 110–121. **665**

The physico-chemical mechanisms by which the physiological balance is maintained between the intracellular, interstitial, and vascular fluids are described, and the changes which upset the balance in the "shock" syndrome are discussed. The clinical signs of the "shock" syndrome in animals are described. Fluid replacement by hypertonic intravenous injections, injections of plasma, and the administration of adrenal cortical extract, is the line of treatment recommended. Dried plasma has been found most convenient for field use. U. also recommends the use of plasma in cases of influenza, strangles, pneumonia, and in the early stages of purpura.—ALFRED T. COWIE.

KENNETH, J. H. (1943). **Gestation Periods. A Table and Bibliography.** pp. 23. Edinburgh: Imperial Bureau of Animal Breeding and Genetics. [4to] [2s.] **666**

This publication gives the duration of the gestation period for some 200 of the better known mammals, including domesticated species, which K. has compiled from a wide search of the literature. Species are set forth in alphabetical order of popular names, and the data are tabulated to show maximum, minimum, and average lengths of gestation in days. For comparative purposes, it would probably have been more useful if the species and relevant data had been arranged under natural orders. The bibliography comprises 340 references, the titles of which are not included.—N. J. S.

IYER, P. R. K. (1942). **Pregnancy Diagnosis in Equines.**—*Indian vet. J.* **19.** 132–137. **667**

A discussion of the hormones present in the blood serum and urine of pregnant mares and of the different biological tests in use for the diagnosis of pregnancy in mares. Urine tests for pregnancy diagnosis are carried out at the Izatnagar Institute, India.

FLEGMATOV, N. (1940). Klinicheskiĭ metod issledovaniya na beremennost'j u oslits. **[Clinical Method of Pregnancy Diagnosis in Asses].**—*Konevodstvo.* No. 11/12, pp. 46-50. [Abst. in *Anim. Breed. Abstr.* **11.** 14. copied *verbatim*]. **668**

An anatomical description of the sex organs of the ♀ is followed by an account of the method of rectal examination (palpation of the ovaries and at the place where the uterine horns diverge) recommended by the author. The findings at various stages of pregnancy (which may be diagnosed by this method from the 22nd–24th day after conception until parturition) are given in detail with illustrations.

MIRSKAYA, L. M. (1941). K etiologii persistiruyushchikh zheltykh tel. **[The Aetiology of Persistent Corpora Lutea].**—*Dokl. vsesoyuz, Akad. sel'skokhoz. Nauk.* No. 7. pp. 23–30. **669**

Thirty-five of 150 cows did not show a recurrence of oestrus 60–152 days after calving. In 23 of these, which had been dry for varying periods before calving, corpora lutea were found on rectal examination. Contrary to the opinion of MCINTOSH [*V. B.* **8.** 717.], M. thinks that the length of the dry period has no influence on the persistency of corpora lutea and the reappearance of oestrus after parturition.

Histological examinations were made of the adrenal glands and corpora lutea of 62 cows in various stages of pregnancy and of 40 pairs of ovaries which were obtained from abattoirs and which were presumed to contain persistent corpora lutea. [The diagnosis that the corpora lutea were persistent was made according to their size, texture, and the ease or difficulty with which they could be enucleated. Neither repeated rectal examination nor histological examination of corresponding endometria was made.] The zona fasciculata of the cortex and the whole adrenal gland itself were in all cases consider-

ably hypertrophied. No differences were found in structure of pregnancy and cyclical corpora lutea.

Based on these findings and on the work of ENGELHART (1930), GALLOW & PARKS (1936), BEALL (1939), the conclusion is drawn that the hypertrophy of the adrenal gland is largely responsible for the source of oestrogenic hormone which is regarded as an essential factor in the formation and normal function of the corpus luteum.

To study the effect of hypersecretion of oestrogenic hormone on the corpus luteum, the following experiments were conducted. Ten female rats with normal cycles received daily from the beginning of oestrus 50 M.U. of α-folliculin. Eight of these, after 8–18 injections, still showed on P.M. examination the presence in the ovaries of normal corpora lutea; the remaining two rats showed recurrence of oestrus only on the 21st day. In the second series of experiments, five female rats which received at the beginning of oestrus a single dose of 500 M.U. of α-folliculin benzoate showed survival of corpora lutea in the ovaries for 17–20 days instead of 2–3 days as in normal animals.

M. suggests that the persistence of the pregnancy and cyclical corpora lutea is due to hypersecretion of the oestrogenic hormones from the adrenal, or of other steroid hormones which are of similar structure.

—A. MOLDAWSKY.

SHAFFNER, C. S., & ANDREWS, F. N. (1943). **The Determination of the Concentration of Spermatozoa in Fowl and Bull Semen.**—*Anat. Rec.* **86.** 99–107. **670**

A method is described for the determination of sperm cell volume in a sample of semen. The procedure is similar to that used for determining the volume of the red blood cells in haematocrit tubes, and involves the centrifugation of a small quantity of the semen in capillary tubes of relatively uniform diameter, and the measurement of the length of the column of packed cells. Over 1,000 tubes of various diameters and length were tested, and it was found that there were no significant variations in sperm cell volume when determinations were made with capillary tubes with inside diameters of 0·5 mm., 0·8 mm., or 1·0 mm. There was a 25% increase in the volume of solid material thrown down by centrifugation when fowl semen was stored for 12 hours at 25°C.; this increase did not occur when fowl semen was stored in ice water. Bull semen stored at 25°C. for 56 hours showed no significant changes in the volume of solid material thrown down. The average coefficient of variability of the determination of sperm cell volume was 7·87% for fowl semen and 5·40% for bull semen. The coefficients of correlation of the haemocytometer concentration count and the centrifugation volume determination were 0·76 and 0·80 for the fowl and bull semens respectively. These comparisons were made on the basis of a single haemocytometer count and a single cell volume determination, but since 5–10 tubes per semen sample can be handled simultaneously, the error of determination could be reduced by the square root of the number of tubes used. The authors point out that the error of predicting sperm cell numbers by the measurement of cell volume is potentially great, and its chief value would be in assisting the reader to visualize volume in terms of relative numbers until the centrifugation method had become widely used.—N. J. SCORGIE.

BARTLETT, S. (1943). **Artificial Insemination Centres for Dairy Cows.**—*Pap. nat. Inst. Res. Dairying.* No. 732. pp. 3. **671**

B. gives a brief account of the conditions which led to the formation, in 1942, of artificial insemination centres at Cambridge and Reading by the Ministry of Agriculture through its Agricultural Improvement Council. The organization of the centres is outlined, the management at each being directed by a local advisory committee. The main sphere of operation is localized to a radius of 10–15 miles from the respective centres, with the possibility of extending this sphere later. Further information about the centres is given under the headings "Method of working", "Method of enrolment", and "Economic aspects".—N. J. S.

SKLOW, J. (1943). **Prolongation of Sex Hormone Effects by Adsorption on Powdered Carbon.**—*Endocrinology.* **32.** 109–112. **672**

The action of certain steroid hormones is shown to be prolonged by adsorption on carbon. This prolongation of hormone effect does not hold true for water-soluble hormones such as chorionic gonadotropin and insulin. The experimental data show that the prolongation of hormone effect by carbon adsorption is most pronounced for oestrone (16-fold). The action of oestradiol benzoate is not significantly prolonged (two-fold) by the same treatment. Progesterone on carbon acts at least 15 times longer than when administered in oil solution in one injection. Testosterone on carbon is five times as effective as testosterone in oil administered in one injection, and twice as effective as in crystal implantation. The action of diethylstilboestrol could not be prolonged by adsorption, this probably being due to a looser adsorption of this substance to the carbon powder.—N. J. SCORGIE.

DEANESLY, R., & PARKES, A. S. (1943). **Deposition of Protein Material in Implanted Pellets of Steroid Hormones.**—*Lancet.* **245.** 500–502. **673**

50 mg. tablets of oestradiol, testosterone, progesterone, and desoxycorticosterone acetate, made by compression, when implanted subcutaneously into rats were absorbed at about the same rate as 50 mg. tablets made by fusion. Both types of tablets acquired an interstitial deposit of protein material as described by FOLLEY for compressed tablets of hexoestrol and stilboestrol implanted into heifers [see *V. B.* **14.** 32, absts. 194 & 195]. Histological examination revealed that the protein meshwork was continuous throughout the compressed tablet, but formed only a superficial envelope in the fused tablet. The interstitial meshwork was sharply demarcated from the connective tissue capsule which forms around implanted tablets and appeared within a few days of implantation, whereas the capsule took several weeks to develop. The deposit formed in tablets containing lactose as excipient was very substantial. There was no evidence that the interstitial deposit slowed up absorption.—ALFRED T. COWIE.

LAQUEUR, G. L. (1943). **Effects of Testosterone Propionate on the Mammary Glands of Female Albino Rats.**—*Endocrinology.* **32.** 81–86. **674**

Forty virgin female rats, injected subcutaneously with varying doses of testosterone propionate, the initial dose being given during late oestrus, showed development of the acini of the mammary glands within 20 days. Of six rats injected for 20 days, four successfully suckled 4–6 young and exhibited all the characteristic maternal instincts. Histologically, the lactating glands of these foster-mother rats were identical with those of normally lactating rats.

It is postulated that when the initial injection is given during late oestrus, the hormone stimulates the production of hypophyseal lactogenic hormone which, in turn, maintains the newly formed corpora lutea, and the continued secretion of progesterone produces the development of the acini. The sucking stimulus on the

morphologically prepared gland then produces lactation. It is believed that the maternal instinct is preserved by the presence of the lactogenic hormone in spite of the presence of the male hormone.

In cases where the injections were continued beyond the 20-day period, the corpora lutea regressed and as they regressed there was a progressive increase in the acinar secretion.—ALFRED T. COWIE.

BERGMAN, A. J., & TURNER, C. W. (1943). **Effect of Pregnancy and Lactation upon the Thyrotropic Hormone of the Rabbit.**—*Endocrinology*. **32.** 59–63. **675**

Assays of the amount of thyrotropic hormone present in pituitaries of groups of 7–15 female rabbits were made at 10, 20, and 28 days of pregnancy and at 2, 5, 10, 20, and 30 days *post partum*. One-day-old male chicks were used for the assays.

The values obtained, whether expressed as amount of thyrotropic hormone per gland, per gramme of pituitary, or per 100 g. of body weight, were within the range of values obtained in assays of groups of non-pregnant females and there was no evidence that pregnancy or lactation influenced this factor. An attempt was made to assay the adrenotropic hormones, but owing to the small amounts present reliable values were not obtained.—ALFRED T. COWIE.

MEITES, J., TRENTIN, J. J., & TURNER, C. W. (1942). **Effect of Adrenalectomy on the Lactogenic Hormone and Initiation of Lactation.**—*Endocrinology*. **31.** 607–612. **676**

In two groups of female albino rats totalling 33 animals, adrenalectomy reduced the lactogen content of the pituitary by 27·5% and 28·9% respectively on a body-weight basis when compared with 15 controls. This reduction after adrenalectomy may have been due to lack of stimulation from circulating oestrogens as the oestrous cycle was suppressed, it may have been due to undernutrition, or, what is considered less likely, it may have been due to a direct inhibitory effect on the pituitary.

Fourteen adrenalectomized rats injected with 200 I.U. oestrone daily for five days had on a body-weight basis 104·5% more lactogen in their pituitaries than the controls, whereas ten unoperated oestrone-treated rats had 216·9% more lactogen. Undernutrition may account for this subnormal stimulation. Experiments involving 29 g. pigs gave somewhat similar results.

Sixteen rats adrenalectomized in the last week of pregnancy showed an increase in pituitary lactogen after parturition of a similar magnitude to that observed in ten intact rats. It is therefore concluded that the failure of rats adrenalectomized during pregnancy to lactate satisfactorily following parturition is not due to a deficiency of lactogen. The authors believe that the failure of lactation can be accounted for by the disturbances to the electrolyte and water balance and upset of the carbohydrate metabolism known to follow adrenalectomy, and they find no conclusive evidence that the adrenal cortex secretes a specific lactation factor.—ALFRED T. COWIE.

PHILLIPS, R. E. (1943). **Ovarian Response of Hens and Pullets to Injections of Ambinon.**—*Poult. Sci.* **22.** 368–373. **677**

A commercial gonadotropic extract, obtained from the anterior lobe of pituitary glands and called "ambinon", when injected intramuscularly into hens and pullets produced marked ovarian stimulation although egg production was decreased. In some cases, deleterious effects on the ovary were noticed, but it was not known to what factor this was due. P. considered that the use of gonadotropic preparations might increase fecundity.—J. D. BLAXLAND.

SMETANA, H., & JOHNSON, F. R. (1942). **The Origin of Colloid and Lipoid Droplets in the Epithelial Cells of the Renal Tubules.**—*Amer. J. Path.* **18.** 1029–1049. **678**

Using urodeles, *Salamandra punctata* and *Necturus maculatus*, the authors studied the origin of colloid and lipoid droplets in the epithelial cells of the renal tubules. Various substances, including egg albumen, serum proteins, and casein, in each case coupled with the disodium salt of 2-naphthol-3 : 6-disulphonic acid, were injected intraperitoneally and the kidneys were examined after intervals which varied from 2–328 days. Previous workers have concluded that in urodeles, the colloid droplets represent protein material absorbed from the lumen of the tubules and by analogy they have suggested that colloid droplets in human renal disease are secondary to a functional change in the glomeruli causing them to become permeable to protein molecules.

Intraperitoneal injection of the various protein-dye compounds was followed by the appearance of coloured colloid droplets in the renal tubule cells in "open" nephrons, these droplets being detectable two days after injection and being still present after 328 days. The droplets were at first large and situated in the supranuclear zone of the cytoplasm; they later moved towards the cell base and became smaller. Fats and lipoids similarly injected were also phagocytosed and stored in the renal tubule cells.

Intravenous injection of the protein-dye compounds in urodeles and mice caused their filtration through the glomeruli and reabsorption and storage in the tubule cells.

These findings strongly suggest that colloid droplets in the human kidney in nephritis and nephrosis arise in a similar way. It is probable that excessive accumulation of colloid droplets of protein within the epithelial cells may cause secondary degenerative changes. The morphological changes in the kidney in lipoid nephrosis are considered to be due to increased glomerular permeability with high serum cholesterol, leading to lipoid droplet accumulation in the tubule cells.—E. G. WHITE.

See also abstr. **630** (blood composition of dogs), **708** (pulse rate of fowls), **648**, **654** (hormones), **717** (gland grafting).

POISONS AND POISONING

WRIGHT, C. (1943). **Plant Problems in Relation to Diseases of Livestock.**—*Vet. Rec.* **55.** 357–358. **679**

A general article on poisons which contains nothing new. Certain factors (*e.g.* stage of growth, effect of soils and climate, etc.) are discussed which may influence the toxicity of plants.—R. ALLCROFT.

POCHAPIN, I. M. (1942). **Medical Aspects of Chemical Warfare.**—*Penn. med. J.* **45.** 795–800. **680**

A general article giving a brief classification of gases, their properties and toxic effects; the principal aspects of first aid and treatment are also described.—R. A.

See also abstr. **656** (lead absorption), **638**, **639**, **641** (arsenotherapy hepatitis), **636** (bovine haematuria and bracken).

THERAPEUTICS AND DISINFECTION

DRUEY, J. (1943). Nomenklatur und Uebersicht der therapeutisch verwendeten Sulfanilamide. **[Nomenclature and Review of the Sulphonamides used in Chemotherapy].**—*Schweiz. med. Wschr.* No. 19/20. pp. 667–669. **681**

The difficulties of the confused nomenclature of the sulphonamides are discussed and a list of some synonyms is given with their chemical structure. Although the list is not very large (24 substances), it is very useful as the continental names of the drugs are given as well as the British or American equivalents. It is suggested that such simplified, but not incorrect names, as sulphapyridine, sulphathiazole, etc., which are already well known should be adopted for world-wide use, and all synonyms allowed to die out. In this connexion, it is pointed out that sulphapyrimidine would be a better name than sulphadiazine, since the chemical group name " diazine " already has another meaning.
—R. ALLCROFT.

MERKELBACH, O. (1943). Sulfonamid-Bibliographie. Querschnitt durch die Literatur über Chemotherapie mit Sulfonamiden. **[Bibliography of the Sulphonamides. A Cross-Section of the Literature].**—*Schweiz. med. Wschr.* No. 19/20. pp. 670–687. **682**

The bibliography comprises 958 references, giving the full titles of the papers, arranged chronologically within the following sections :– Chemistry ; Bacteriology, Pharmacology and Toxicology ; Mode of Action ; Secondary Effects ; Surgery ; Local Application ; Dermatology ; Venereology and Urology ; Obstetrics and Gynaecology ; Internal Medicine ; Pediatrics ; Eye, Ear, Nose and Throat Disorders ; Dentistry.
—R. ALLCROFT.

SANDERS, D. A. (1943). **Further Observations on the Use of Iodized Mineral Oil as a Treatment for Bovine Mastitis.**—*J. Amer. vet. med. Ass.* **102.** 86–89. [See also *V. B.* **12.** 355]. **683**

Non-lactating cows with mastitis were given intramammary injections of 300–500 ml. of a 1 : 1,250 solution of iodine in liquid paraffin, the iodine first being dissolved in ether. This solution was found non-irritant to the dry udder of 20 cows with chronic mastitis and is claimed to be non-irritant also to the lactating cow affected with mastitis. Results of treatment were judged by microscopic examination of incubated milk samples and the treatment is stated to have been " of value in destroying mastitis microorganisms and eliminating the high leucocyte content of milk due to infection ". No details of these examinations are given.
—D. L. ROBARTS.

ALLEN, R. W., & FARR, M. M. (1943). **Sulfaguanidine as a Prophylactic During the Period of Acquirement of Resistance by Chickens to Cecal Coccidiosis.**—*Amer. J. vet. Res.* **4.** 50–53. **684**

Chickens must develop a mild form of the disease before they become resistant to caecal coccidiosis. Various workers have shown that sulphaguanidine is effective in preventing caecal coccidiosis and that the degree of protection bears a direct relation to the quantity of drug administered. No clinical symptoms become evident when infected birds are fed a 1–2% concentration of the drug, but such birds are highly susceptible to reinfection one month after administration of the drug has ceased, which seems to imply that almost complete protection had been afforded by the treatment. The possibility was explored that a lower concentration of sulphaguanidine might partly or wholly suppress the disease and yet allow immunizing infections to develop. When the drug was fed in mash at a concentration of 0·5% for three days before and 14 days after young chickens were exposed to infection either by inoculation and by exposure to infected litter, or by contact with infected litter only, the mortality was considerably reduced. Chickens treated with 0·5% sulphaguanidine and maintained on infected litter for 21 days after cessation of treatment showed a resistance which was quite as pronounced as that of surviving untreated controls and the weight gains of the treated birds did not differ materially from those of the surviving controls. The results indicate that further work along these lines would be profitable.—C. HORTON SMITH.

LEVINE, P. P. (1943). **The Selective Action of Sulfaguanidine on Avian Coccidia.**—*J. Parasit.* **29.** 362–363. **685**

Sulphaguanidine fed to chickens at the rate of 0·5% of the ration suppressed all species of coccidia except *Eimeria tenella* and *E. necatrix*. Infections with these two species were markedly reduced when the concentrations were increased to 1·0% and 1·5% respectively. L. points out that these observations indicate the way to a convenient method for the isolation of the various species.—C. HORTON SMITH.

HARWOOD, P. D., & GUTHRIE, J. E. (1943). **Triethanolamine Hydrochloride and Mixtures of Micronized, Wettable Sulfur with Urea for the Control of Experimental Coccidiosis of Chickens.**—*Proc. helminth. Soc. Wash.* **10.** 90–93. **686**

Triethanolamine and similar chemicals were found to destroy oocysts in the presence of chicken faeces. The effect was, therefore, investigated of 4–5% of triethanolamine hydrochloride in the mash in clinical caecal coccidiosis in chickens. A mixture of equal parts of urea and micronized, wettable sulphur was also investigated. The sulphur-urea mixture fed at the rate of 1% (= 0·5% sulphur) of the mash reduced deaths by two-thirds, and it appears to have more promise than triethanolamine hydrochloride, which is, however, of some value in the prevention of experimental caecal coccidiosis.—C. HORTON SMITH.

REMLINGER, P., & BAILLY, J. (1942). Action de l'essence d'eucalyptus sur quelques ultravirus neurotropes. **[Action of Eucalyptus Essence on some Neurotropic Viruses].**—*Ann. Inst. Pasteur.* **68.** 428–430. **687**

The viruses of rabies, Eastern equine encephalomyelitis, and Aujeszky's disease, exposed in nervous tissue to the vapour of eucalyptus essence, were inactivated in 10, 56, and 132 hours respectively.—I. W. B.

COLLIER, H. B., ALLEN, D. E., & SWALES, W. E. (1943). **Observations on the Fate of Phenothiazine in Domestic Animals.**—*Canad. J. Res.* Sect. D. **12.** 151–159. **688**

Chromatographic and spectrometric observations of the derivatives of phenothiazine, as excreted in the urine of sheep, horses, dogs, rabbits, and pigs, showed that the chief product excreted by sheep and horses is, apparently, potassium leucophenothiazone sulphate ; preliminary observations on dog urine showed that phenothiazone comprised the red pigment. The urine of treated rabbits contained a large amount of thionol and a smaller amount of phenothiazone. Pig urine contained no conjugated phenothiazone ; thionol and a sulphonium salt were detected : it is evident that the fate of phenothiazine in the pig is markedly different from that in other animals.

A point of particular interest is that micronized phenothiazine was more readily oxidized and excreted by the urinary tract than was the ordinary commercial form ; this would affect adversely the anthelmintic value

of micronized phenothiazine. In one test, a dose of phenothiazone failed to remove *Haemonchus contortus*; this derivative was found to be excreted in a conjugated form in the urine.

No conclusions are drawn as to the relationship between the identity of excreted derivatives and anthelmintic activity in the various animals.

—W. E. Swales (Canada).

Bryan, A. H. (1943). **Veterinarians and the Cancer Problem.**—*Vet. Med.* **38.** 340–342. **689**

B. suggests that administration of foods rich in avidin (a growth-inhibiting factor present in egg albumen), *e.g.* whites of eggs, may be of value in treating neoplasms in dogs. It is suggested that the diet of affected dogs should be adjusted to avoid excessive intake of the cell-stimulating substance, biotin, and at the same time should include an abundant supply of avidin. Treatment, recommended by B., of early cases of neoplasia in dogs includes giving the whites of a dozen or more eggs twice daily. Four cases are cited in which the use of vitamin K (2–5 mg. three times daily on an empty stomach), together with abundant avidin in the form of egg-white, apparently caused regression of neoplasms.—E. G. White.

Kliewe, H., & Früchte, E. (1942). Über Luftdesinfektionsmittel und ihre Bedeutung bei der Bekämpfung von ansteckenden Krankheiten der Luftwege. **[The Disinfection of Air and its Significance in Control of Infectious Respiratory Diseases].**—*Z. Hyg. InfektKr.* **124.** 480–487. **690**

Disinfectant action *in vitro* gives no clue to the activity of a material when incorporated into aerosols, and the usual disinfectants were found to have little action when so tested. Ethylene glycol has some activity and will increase the activity of other disinfectants when mixed with it. The authors state that an ethylene glycol-resorcinol-alcohol mixture is the most suitable material.—J. G. Carr.

See also absts. **596**, **609** (anthelmintics), **590** (uses of antireticular cytotoxic serum).

HYGIENE AND PUBLIC HEALTH

—. (1941). **Standard Methods for the Examination of Dairy Products. Microbiological, Bioassay and Chemical.** pp. xvi+288. 1 appendix. New York, N.Y.: American Public Health Association. [8th Edit.] [8vo] [$3.00]. **691**

This eighth edition consists of four main parts, *viz*, I, "Microbiological Methods for the Examination of Milk, Cream and Butter"; II, "Microbiological Methods for the Examination of Frozen Desserts and Ingredients of Frozen Desserts"; III, "Bioassay of Vitamin D Milk"; IV, "Chemical Methods". There is an appendix on "Proposed Phosphatase Methods for Determination of Pasteurization". Each main part is divided into chapters which are again divided into numbered subsections listed in the table of contents so that it is very easy to find any particular section; there is also an index. The chapters in part I deal with the following:—"Samples and Sampling Equipment"; "Agar Plate Method"; "Direct Microscopic Method"; "Methylene Blue Reduction Method"; "Sediment Test"; "Tests for Organisms of the Coliform Group"; "Tests for Pathogenic, Usually Hemolytic Streptococci"; "Examination of Milk for Tubercle Bacilli"; "Procedures for the Detection of *Brucella* spp. in Milk"; "Microbiological Methods for the Examination of Butter"; and "Tests for Sterility of Dairy Containers, Utensils and Equipment". In an appendix to the chapter on "Methylene Blue Reduction Method", it is pointed out that in view of the unsettled controversy on the resazurin test, no recommendation either for or against the use of this test is made in this edition.—R. A.

—. (1943). **A Safe Milk Supply. Memorandum of the People's League of Health on the Compulsory Pasteurisation of Milk.** pp. 10. London: People's League of Health (Inc.). [fcp]. **692**

The need, on scientific grounds, for the compulsory pasteurization of milk is very briefly set forth, together with the trade objections to pasteurization.

The immediate pasteurization of all milk is favoured but, owing to the difficulties in bringing this into effect, the following procedure is suggested:—(1) That any compulsory pasteurization order should for the present be limited to all urban areas over a certain population, such as 10,000, and also that during this period distributors who supply "tuberculin tested" milk or milk from "attested" herds be not obliged to pasteurize their milk. That this Order should not be made operative until after at least six months, to allow time for the required plant to be obtained and adequate supervision arranged. (2) That the smaller urban areas and rural areas should have the same powers after application to, and approval by, the Ministry of Health. (3) That after a suitable period, these compulsory pasteurization requirements be extended to all milk supplies.—H. E. Bywater.

Sylvestre, J. E. (1943). La pasteurisation du lait pour ou contre. **[Pasteurization of Milk].**—*Canad. J. comp. Med.* **7.** 133–135. [In French]. **693**

It is not possible to hope that the production of milk can be always carried on under ideal sanitary conditions. Annual examinations do not prevent the development of disease in cows between tests, and there is no way of assuring that milkers will always be healthy. It is easier to check 20 pasteurization plants than 300 milkers. Vitamin C is the only loss through pasteurization, and pasteurized milk has been shown in practice to be better than raw milk for infant feeding.

—R. Gwatkin (Canada).

Brown, A. (1943). **Pasteurization of Milk and Infant Mortality Rates in Toronto, Vancouver, and Victoria.**—*Brit. med. J.* July 31st. 133–134. **694**

The infant mortality rates of Toronto, Vancouver, Victoria, and a number of other Canadian cities are discussed in order to decide what factors are responsible for the considerable variations recorded. It is concluded that neither climate nor pasteurization of milk has any great influence, the larger number of deaths in some cities being due to greater incidence of premature birth.

—D. D. Ogilvie.

Borts, I. H., Harris, D. M., Joynt, M. F., Jennings, J. R., & Jordan, C. F. (1943). **A Milk Borne Epidemic of Brucellosis Caused by the Porcine Type of Brucella (Brucella suis) in a Raw-Milk Supply.**—*J. Amer. med. Ass.* **121.** 319–322. **695**

An outbreak is described in persons in a small community, caused by raw milk infected with *Br. suis*. All patients received milk from the same farm where *Br. suis* was isolated from the milk of two cows. Four out of 43 cows reacted to the agglutination test, and of 24 sows on the farm, 11 gave positive and three suspicious reactions. One sow had given birth to stillborn pigs or to pigs which died shortly after birth, otherwise there was no evidence of illness or abortion in the pigs.

Positive aggln. reactions in human beings continued to be obtained for several months after the suppression of the infected milk supply, this being considered indicative of a prolonged period of incubation.

An intradermal test in human beings with brucellergen was less reliable than the aggln. test. Treatment was by brucellin (a culture-free filtrate) and sulphonamides.—H. E. Bywater.

Kingman, H. E., Jr. (1943). **The Veterinarian in the War Program of the Meat Industry.**—*J. Amer. vet. med. Ass.* **103.** 147–151. **696**

Of the entire income of agriculture in the U.S.A., 29% is derived from meat animals. In 1941, this amounted to 2,000 million dollars. During the year, there were 71 million cattle, 54 million pigs, and 55 million sheep in the country. Federally inspected animals slaughtered in 1941 totalled 10,946,000 cattle, 48,000,000 pigs, and 18,000,000 lambs. In 1942, it is estimated that these figures were increased by 4–10%. The annual loss in marketed animals due to injuries, parasites, and disease is approximately 30 million dollars. This does not include the losses on farms in deaths, lowered yields, and unprofitable gains. Losses of cattle carcasses by condemnation are now approximately 0·6%. The conditions responsible, in order of frequency, are pneumonia, pyaemia and septicaemia, emaciation, pericarditis, tumours, metritis, and TB. Nearly 10% of all beef livers are condemned. Warble-fly destroys about 5 million dollars' worth of hides each year. Nearly 50% of cattle intestines are so badly parasitized that they are useless for casings. In pigs, the chief losses are due to swine fever and erysipelas, but in 1941, TB. caused losses estimated at a million dollars, involving the condemnation of 15,317 carcasses and 238,183 heads. Pneumonia and pyaemia also caused severe loss. Nearly 9% of pigs' livers are condemned. In sheep, internal parasites are of major importance. Nearly 15% of sheep livers are condemned.

The role of the veterinarian in the reduction of these losses is discussed.—D. D. Ogilvie.

McLellan, D. J. (1943). **Meat Inspection and Its Ramifications.**—*Canad. J. comp. Med.* **7.** 65–71. **697**

An address covering meat inspection procedures on cattle, sheep, and swine carried out in the 93 packing houses in Canada, operating under Dominion Government inspection. Bruising, and infestation of hides with warbles, cause heavy loss in cattle carcasses. Condemnations of calves for immaturity is a cause of unnecessary loss; condemnations in sheep are mainly confined to various portions of carcasses, due to parasitism. A detailed description is given of the preparation of Wiltshire type bacon for the British market, from *ante mortem* examination of the pig to the finished product.

As practically 100% of a carcass is processed into various articles, the majority of which are used by the armed forces, the importance of by-products in wartime is obvious when it is considered that only 70%, 55%, and 47% of the carcasses of swine, cattle, and sheep respectively yield meat products. The various by-products from the three species are briefly mentioned.—L. M. Heath (Canada).

Prokhorov, M. I. (1941). Mikroflora myasoproduktov vynuzhdenno ubitykh zhivotnykh. **[Bacterial Flora of Meat of Animals Slaughtered in Emergency].**—*Veterinariya, Moscow.* No. 1. pp. 93–99. [French summary]. **698**

During 1938–39, 16,438 meat samples were examined, in accordance with the regulations of the Soviet Ministry of Agriculture. Of 6,560 beef samples examined, salmonella were found in 1·4%, *Bacterium coli* in 20·7%, cocci in 25·5%, *Proteus* in 0·9%, and certain specific pathogenic bacteria (including *Bacillus anthracis*) in 0·1%. For 1,739 veal samples, the figures were salmonella in 5·6%, *Bact. coli* in 26·2%, cocci in 26·9%, and *Proteus* in 1·6%. For 7,650 pork samples the figures were salmonella in 16%, *Bact. coli* in 22·8%, cocci in 16·6%, *Proteus* in 1·3%, and pathogenic bacteria (including *Erysipelothrix rhusiopathiae*) in 5·9%. Out of 163 mutton samples, salmonella were found in 3%, *Bact. coli* in 24%, and cocci in 20·2%. Of 331 horse flesh samples, salmonella were found in 1·5%, *Bact. coli* in 13%, cocci in 34·5%, and *Proteus* in 1·8%.

With regard to seasonal incidence, salmonella were more frequent in the third and fourth quarters of the year, *Bact. coli* and cocci in the second and third quarters, and *Proteus* in the third.

P. approves of the regulation which requires compulsory bacteriological examination of all carcasses slaughtered in emergency. He also discusses the fitness for human consumption of carcasses in which *Bact. coli* and cocci have been found; he considers that these bacteria cannot always be regarded as harmless. He emphasizes the necessity for experimental work and recommends the organization of research stations attached to laboratories concerned with bacteriological food inspection.—A. Moldawsky.

Roberts, J., Deadman, W. J., Elliott, F. G., & Wilson, R. J. (1942). **The Epidemiology of Staphylococcal Food Poisoning in Three Outbreaks in Hamilton, Canada.**—*Proc. 6th Pacific Sci. Congr., 1939.* **5.** 369–376. **699**

The source of infection in three cases of staphylococcal food poisoning in man is discussed. Although it is known that a number of cases have occurred in the past through ingestion of milk from cows with staphylococcal mastitis, it is considered that infection in these cases originated in the nose and throat flora of persons handling food.—D. D. Ogilvie.

See also absts. **600** (beef and pork tapeworms in Europe), **603** (trichinosis).

TECHNIQUE AND APPARATUS

Nelson, F. E. (1943). **Factors which Influence the Growth of Heat-Treated Bacteria. I. A Comparison of Four Agar Media.**—*J. Bact.* **45.** 395–403. **700**

After a review of the literature concerned with the relationship of the growth medium to the survival of pure cultures of heat-treated bacteria, results are given of the comparative evaluation of nutrient, " new standard milk ", beef infusion, and synthetic agars for the growth of *Bacterium coli, Pseudomonas aeruginosa, Bacillus subtilis, Staphylococcus aureus,* and various streptococcal strains subjected to heat treatment of sublethal or partially lethal intensity. Apparent survival of heat-treated bacteria proved to vary considerably on different media, the relative suitability of which varied according to the test organism employed. Beef-infusion agar yielded the highest viable count for most of the heat-treated strains examined, while the " new standard milk " agar was superior to nutrient agar for enumeration of heat-treated thermostable lactic streptococci. Bacteria subjected to heat at partially lethal levels were found to be more fastidious in their growth requirements than unheated control organisms.

In N.'s opinion, this should be considered in the selection of media for bacterial counts of heated food

products and in experiments concerned with bacterial heat stability.—R. O. Muir.

Woodruff, C. E., Kelly, R. G., & Leaming, M. A. (1943). **The Culturing of Tubercle Bacilli from the Human Spleen, Liver and Kidney.**—*Amer. Rev. Tuberc.* **48.** 76–81. [Spanish summary]. **701**

A cultural technique for determining the number of tubercle bacilli in a given organ is described. Those organs containing caseous, miliary tubercles gave the highest counts.—A. R. Jennings.

McBee, R. H., & Speck, M. L. (1943). **An Anaerobic Culture Tube for Determining CO_2/H_2 Ratios of Coliform Bacteria.**—*J. Bact.* **46.** 89–97. **702**

An anaerobic culture tube was designed, in which could be measured the relative volumes of carbon dioxide and hydrogen produced by coliform organisms from glucose. Experiments indicated that the characteristic CO_2/H_2 ratio of *Escherichia* and *Aerobacter* could be obtained after one day's incubation at 30°C. The usefulness of the tube is indicated in routine identification of members of the *Aerobacter* and *Escherichia* genera and their "intermediates".—A. R. Jennings.

Levine, M. (1943). **The Effect of Concentration of Dyes on Differentiation of Enteric Bacteria on Eosin-Methylene-Blue Agar.**—*J. Bact.* **45.** 471–475. **703**

The variable results obtained in different laboratories employing eosin methylene-blue agar (E.M.B.) can be attributed in the main to variations in the absolute and relative concentration of eosin and methylene-blue in actual dye content. A formula is given for E.M.B. agar, the medium being suitable for both the detection of the paratyphoid-dysentery bacteria and their differentiation from coliform micro-organisms.
—M. L. Levi.

Cruickshank, J., & Macdonald, A. (1942). **Aerobic Culture of Anaerobes with Ascorbic Acid.**—*Mon. Bull. emerg. publ. Hlth Lab. Serv., Lond.* pp. 10–12. **704**

When adequate equipment for satisfactory anaerobic technique is lacking, the addition of ascorbic acid to aerobic fluid media is a useful substitute, as it facilitates the growing of most of the sporing anaerobes. Injection of whole cultures grown in ascorbic acid media produced the characteristic pathological lesions in animals. The acid in powder form, such as "Redoxon", is most satisfactory, and is usually sterile. It may be added to fluid media either as a powder or dissolved in water, the minimal concentration required being 0·025%. Plain nutrient broth, glucose broth, Robertson's meat medium, or peptone water may all be used with the ascorbic acid method. A technique is described for cultivation on Petri plates. The ascorbic acid method, when compared with McIntosh & Fildes' technique, proved satisfactory both in the degree of growth obtained with some of the sporing anaerobes, and in the isolation of anaerobes from clinical material.
—E. M. Cruickshank.

Shults, N. G. (1940). K metodike individual'nykh koprologicheskikh issledovanii pri gruppovom soderzhanii zhivotnykh. [**Methods of Individual Coprological Investigation of Animals Maintained in Groups**].—*Proc. Moscow Zool. Park.* **1.** 243–246. [Abst. from English summary]. **705**

In order to identify individually the faeces of large carnivores maintained in groups, S. introduced various cereals into the animals' rations. Rice and millet proved most suitable, about 15 g. being added to the usual food for a tiger or a lion, and 30 g. for a brown bear or a polar bear. The main mass of the cereal was passed within 24 hours. Some of the animals consumed very unwillingly food containing cereals.

It was noted that ascarids were discharged after consumption of rice by a tiger and by a lion × tiger hybrid.

Smith, G. S. (1943). **A Danger Attending the Use of Ammoniacal Solutions of Silver.**—*J. Path. Bact.* **55.** 227–228. **706**

Ammoniacal solutions of silver should be used as soon as possible after preparation and any excess immediately thrown away. In no circumstances should they be stored or kept in bottles, as they may become explosive after varying periods of time.

McNutt, S. H. (1943). **A Partial Comparative Estimate of Three Methods for the Propagation of Infectious Agents in Developing Chick Embryos.**—*Vet. Student, Iowa.* **6.** 9–11 & 41–42. **707**

A general note on the subject. No new material is presented.—J. E. Lancaster.

Henderson, E. W., & Hathaway, H. E. (1943). **A Method of Measuring Pulse Rate of Domestic Fowl.**—*Poult. Sci.* **22.** 44–46. **708**

The authors state that fowls are so easily excited that even the best auditory-manual methods of counting the pulse rate are impossible. They suggest that testing with a portable apparatus at a regular time of handling the birds (*e.g.* when trap nest recording) would be the best method of determining pulse rate under "normal conditions".

They describe and illustrate a crystal stethoscope microphone with a preamplifier and a Western Electric two-speed recording machine. The microphone was applied between feather tracts on the left side and just above the anterior portion of the sternum. The amplified pulse rate was recorded at two successive 15-sec. periods (Kodak timer) on wax records at 78 r.p.m. The count was made by playing the record at 33⅓ r.p.m. Alternatively, a direct count may be obtained by connecting an electric counter relay in the circuit. Only the movable microphone needs to be taken to the fowl.

The mean pulse rate of several breeds of fowls, though probably in a slightly excited condition, by this method was 370 per min., standard deviation 30·86.
—C. V. Watkins.

See also absts. **581** (tuberculin preparation), **691** (testing of dairy products), **591** (antiserum assay), **552** (virus preservation), **562**, **563** (virus concentration), **573** (virus demonstration by eye test), **570** (preparation of S.F. vaccine), **663** (blood pressure determination in dogs).

MISCELLANEOUS

Johnstone-Wallace, D. B. (1943). **Pasture Improvement and Management Practices in Relation to Veterinary Science.**—*Cornell Vet.* **33.** 120–130. Discussion pp. 130–132. **709**

This paper explains the principles of grazing management and pasture fertilization, and shows how practices based upon these principles may have an important bearing in the control of animal disease. The author first underlines the importance of an accurate study of the grazing habits of animals in relation to pasture management, and gives details of the time beef cattle spend in grazing, distance walked, and type of

herbage preferred. An observation having an important bearing on parasite control is recorded, namely that animals, particularly horses and, to a lesser extent cattle, usually refuse to graze in the vicinity of droppings of their own kind, although they have apparently no objection to grazing near the droppings of other species. This refusal appeared to be associated with the animals' sense of smell. The development of methods of rotational grazing, including the utilization of various species, *e.g.* sheep and cattle, as an aid to parasite control is indicated. After discussing the principles underlying the use of chemical fertilizers with reference to specific examples, the author points out that improvement of pasture herbage by increasing its protein content, by improving its calcium-phosphorus ratio and by decreasing its percentage of lignin, bears an important relation to the prevention of diseases in animals.—N. J. SCORGIE.

TISSEUR, H. (1939). Identification du cheval par les empreintes palatines. **[Identification of Horses by Palate Prints].**—*Thesis, Lyons.* pp. 45. **710**

T. outlines a provisional scheme for recording palate prints of horses. These prints may be photographs taken by the aid of a mirror or on impressions taken by means of a special plastic "Stents Stella" which is soft only when heated; the impression is made of the area of the upper palate between the incisors and premolars.

Classification of the prints allows of an index system somewhat similar to that of the fingerprint system and is based on anatomical variations in the size, shape, symmetry, and interrelationship of the median tubercle (papilla incisiva), the central raphé, and the first five transverse ridges on each side of the raphé. Further subclassification deals with the actual characters of each of the ten ridges (straight, curved, undulating, ridged, or bifid), and whether they leave the furrow horizontally or pass anteriorly or posteriorly. All these variations may be accurately recorded by a set table comprising an arrangement of only 29 figures, letters, or symbols.

The area of the palate concerned is described in detail and suggestions are made for noting all the many other variations of each feature described once the main group has been fixed. T. only claims that many prints made during several years have shown that classification by his formulae remains invariable. It would be ideal if always allied to a photograph of the part or a mould of the print.—C. V. WATKINS.

LEVI, W. M. (1941). **The Pigeon.** pp. xxxii+512. Columbia, S.C.: R. L. Bryan Company. [4to] [£3.0.0.] **711**

L. was in charge of a Pigeon Section of the U.S. Army Signal Corps during the war of 1914–18 and has been a leader in pigeon breeding circles in the U.S.A. for many years. The 12 chapters deal respectively with:– The Relationship of Pigeon and Man; Breeds and Varieties; Anatomy; Physiology; Genetics—Variation and Inheritance; Practical Breeding; Behaviour; Diseases, Parasites, and Pests—Their Treatment and Control; Feeds and Feeding; Housing; Commercial Squab Production; The Pigeon Fancy—Exhibiting, Racing, Training, Organization, etc.

The scientific sections are elementary, but contain much useful information. The book is profusely illustrated.—W. A. P.

—. (1943). **Annual Review of Biochemistry. Volume XII.** [Edited by LUCK, J. M., & SMITH, J. H. C.] pp. ix+704. Stanford University P.O., Calif.: Annual Reviews, Inc. [8vo]. **712**

This 12th volume contains much of interest to those who wish to keep in touch with the rapidly expanding fields of biochemistry and, as usual, a wide range of subjects is authoritatively reviewed. The subjects dealt with are as follows:– "Biological Oxidations and Reductions" by F. LIPMANN; "Proteolytic Enzymes" by R. M. HERRIOTT; "The Steroids" by H. SOBOTKA and E. BLOCH; "The Chemistry of the Proteins and Amino Acids" by L. F. HEWITT, R. A. KEKWICK, and A. S. MCFARLANE; "The Chemistry and Metabolism of the Compounds of Sulfur" by J. C. ANDREWS; "Carbohydrate Metabolism" by H. J. DEUEL, Jr.; "Fat Metabolism" by G. O. BURR and R. H. BARNES; "The Metabolism of Proteins and Amino Acids" by H. BORSOOK and J. W. DUBNOFF; "The Chemistry of the Carbohydrates" by H. S. ISBELL; "The Chemistry of the Lipins" by S. J. THANNHAUSER and G. SCHMIDT; "Mineral Nutrition" by L. A. MAYNARD and J. K. LOOSLI; "The Chemistry of the Hormones" by H. FRAENKEL-CONRAT; "Water-Soluble Vitamins" by R. J. WILLIAMS; "Fat-Soluble Vitamins" by K. HICKMAN; "Nutrition, 1941 and 1942" by C. S. LANFORD and H. C. SHERMAN; "Animal Pigments" by C. RIMINGTON; "Synthetic Drugs" by T. C. DANIELS; "Photosynthesis" by E. S. JOHNSTON and J. E. MYERS; "Mineral Nutrition of Plants" by D. I. ARNON; "Carbon Dioxide Assimilation in Heterotrophic Organisms" by H. A. KREBS; "Biochemistry of Microorganisms" by C. B. van NIEL; "The Electron Microscope in Biology" by L. MARTON; "The Chemistry of Viruses" by C. L. HOAGLAND; "Microchemistry" by A. A. BENEDETTI-PICHLER.

It is difficult to single out any particular chapter for more detailed description, but those interested in the electron microscope will find a good description of its mechanism and uses in the section dealing with this subject.—R. ALLCROFT.

—. (1942). **A Symposium on Respiratory Enzymes.** pp. xii+281. Madison, Wis.: The University of Wisconsin Press. [8vo]. **713**

This symposium is composed of 15 main parts, dealing with INTERMEDIATE CARBOHYDRATE METABOLISM; OXIDATIVE MECHANISMS IN ANIMAL TISSUES; DISCUSSION ON HYDROGEN TRANSPORT; PASTEUR EFFECT; OXIDASES, PEROXIDASES, AND CATALASE; NICOTINAMIDE NUCLEOTIDE ENZYMES; THE FLAVOPROTEINS; CYTOCHROMES; PHOSPHORYLATION OF CARBOHYDRATES; DISCUSSION ON PHOSPHORYLATION; METABOLIC CYCLES AND DECARBOXYLATION; TRANSAMINATION; DISCUSSION ON TUMOUR RESPIRATION; DISCUSSION ON BACTERIAL RESPIRATION; DISCUSSION ON ANIMAL TISSUE RESPIRATION.

Each main part contains several articles, and is signed by one of the contributors, although other contributors are responsible for some of the articles. There are altogether 27 contributors to the symposium.

—W. A. P.

REPORTS

U.S.A. MONTANA. (1942). **Report of the Montana Livestock Sanitary Board December 1, 1941 to November 30, 1942.** [BUTLER, W. J.] pp. 20. Helena, Montana. [4to] [Mimeographed]. **714**

A general report of the animal disease position in Montana during 1942 shows that there were 47 cases of EQUINE ENCEPHALOMYELITIS with 18 deaths. Tuberculin testing of 41,360 cattle revealed 31 reactors (0·07%). Blood testing of 54,789 cattle for BRUCELLOSIS showed 2,373 reactors (4·3%) and 1,916 doubtful reactors (3·5%). No cases of ANTHRAX or JOHNE'S DISEASE were reported. There were 15 cases of REDWATER and two

cases of MALIGNANT CATARRH in cattle. In sheep, FOOT ROT and HELMINTH INFESTATION caused the greatest loss. There were no cases of SHEEP SCAB. 32 cases of SWINE ERYSIPELAS were reported and SWINE FEVER was diagnosed on 31 premises.

In the bacteriological and pathological laboratory, 62,975 specimens were examined. A list of the results is appended.

In the chemical laboratory, 2,423 analyses were made. Deficiency diseases appeared to be increasing in frequency. The results of the analyses are tabulated.
—D. D. OGILVIE.

See also absts. **539** (trypanosomiasis in Bechuanaland), **596** (report of Parasitologist, Zool. Soc. London), **606-609** (Punjab parasitological research scheme).

BOOK REVIEWS

LINTON, R. G. [Ph.D., M.R.C.V.S., Professor of Hygiene and Vice-Principal, Royal (Dick) Veterinary College, Edinburgh, Author of "Veterinary Hygiene"], & WILLIAMSON, G. [O.B.E., M.R.C.V.S., D.V.S.M., Senior Lecturer, Department of Hygiene, Royal (Dick) Veterinary College]. (1943). **Animal Nutrition and Veterinary Dietetics.** pp. viii+510. 2 plates, 1 appendix. Edinburgh: W. Green & Son, Ltd. [8vo] [2nd Edit.] [35s.] **715**

The form and arrangement of this new edition of Linton's well known text-book are very similar to those of its predecessor. The subject matter has, however, been thoroughly revised and many sections have been extended to deal with the considerable amount of new information which has accumulated in the 16 years which have intervened since the first edition was published. For example, the section on ensilage has been extended, the space devoted to poultry feeding has been doubled, there are new sections on the grading and uses of dried grass and on rabbit feeding, a note on the Lehmann system is included in "The Feeding of Pigs", the vitamins now take up 36 pages in place of the previous four, and there are short notes on the trace elements such as copper, cobalt, and manganese. On the other hand, section VI of the 1st edition has been omitted, information on "harmful foods" being included throughout the general text.

This new "Linton" should provide a welcome and very useful addition to the bookshelves of members of the veterinary profession and a valuable text-book for the veterinary student.—J. LOCHIEL MCGIRR.

—. (1943). **Diseases of Poultry.** [Edited by BIESTER, H. E. (Veterinary Research Institute, Iowa State College), & DEVRIES, L. (Division of Science, Iowa State College.)] pp. xiii+1005. 324 figs. Ames, Iowa: Iowa State College Press. [8vo] [$8.50]. **716**

A proposal to revise VAN HEELSBERGEN'S text-book on poultry diseases was considered, but in view of the great advances which have been made in the knowledge of poultry diseases, it was decided to compile an entirely new book. The method adopted was to assign the subjects to various American research workers, 34 of whom have contributed. Little limitation was placed upon the collaborators and as a result there is considerable variation in the style and length of the contributions. The reader can be in no doubt that each chapter is written by one who has wide experience and a thorough knowledge of the subject. It would be difficult to single out any from the many excellent chapters for special mention. All are written in a most interesting manner.

For those seeking more detailed information, a list of references is given at the end of each chapter. There is usually an indication in the text to show which authority is being quoted; unfortunately, this is not so in the chapter on infectious laryngotracheitis.

In their preface, the editors state that the book is based upon the problems and conditions prevailing in America. It is a pity that this limitation has been made, since it detracts from the value of the book to readers outside the U.S.A.

Diseases which do not occur in the U.S.A. are inadequately discussed. Thus Newcastle disease is mentioned only in the differential diagnosis of fowl plague. Spirochaetosis, a disease of great economic importance in many parts of the world, is treated very briefly. Further, in a book of this character it seems desirable to include an account of all the pathological conditions of fowls that have been recorded. No attempt to do this has been made. There is, for example, no reference to Siefried's infectious paralysis of fowls, to Hendrickson and Hilbert's *Pfeifferella anatipestifer* infection of ducks, nor to cerebellar ataxia of newly hatched chicks.

The book includes a long and excellent chapter by W. R. HINSHAW on the diseases of turkeys. The diseases of waterfowl are not given special consideration.

This text-book can be confidently recommended to all veterinarians whose work or interest brings them into contact with poultry. Those concerned with routine diagnosis or research into the diseases of poultry cannot fail to be stimulated and to learn much from a thorough study of this book. The graphic descriptions of symptoms and lesions and excellent illustrations will prove of great value to the student.—F. D. ASPLIN.

VORONOFF, S. Les sources renouvelées de la vie. **[Renewed Sources of Life].** pp. 299. 51 figs. New York, N.Y.: Brentano's, Inc. [8vo] [15s.] **717**

In the absence of a preface, it is difficult to know for what type of reader this book is intended. It is a semi-popular work giving a general account of gland grafting in animals and man with especial reference to the author's own work in this field. The only references provided are a list of the author's own publications: these consist mainly of articles and books on gland grafting, beginning with a paper on ovarian grafts published in 1912.

There are a number of photographs showing the striking effects of grafting in animals and man and the book may be of some interest to veterinarians. The tissues considered include ovary, testis, thyroid, bone, and skin.

The author was able, in 1923, to persuade the French government to prohibit the killing of chimpanzees in the French colonies in Africa and he has also tried to convince other countries of the need to preserve this animal because of its value for testicular grafts in man. He states that there are insufficient apes' testicles to provide grafts for the needs of all the senile patients of even one generation. The author has participated in about 2,000 gland graftings and his methods have been followed by many other workers in various parts of the world.

Although printed in New York, the book is typically French in format. There is, unfortunately, no index.
—E. G. WHITE.

See also absts. **691** (standard methods for examinations of dairy products), **658** (dynamic state of body constituents), **711** (the pigeon), **712** (annual review of biochemistry), **713** (symposium on respiratory enzymes).

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